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TUBERCULOSIS CONSIDERED FROM A SANITARY POLICE AND ALIMENTARY POINT OF VIEW.*

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(AFTER alluding to the Organising Committee of the International Veterinary Committee having desired Dr. Lydtin of Carlsruhe, Professor Perroncito of Turin, and Professor Arloing of Lyons, to prepare a report on Tuberculosis, and of the former having been unable to comply, the author admits that during the five years which have elapsed since the last Congress held at Brussels, much light has been thrown upon the disease by the experimental researches which have been made, and thinks that in a reunion of veterinary surgeons from every part of the world, the special questions as to the sanitary measures and the alimentary hygiene relating to it, should receive careful deliberation.)

1. *Tuberculosis considered from a Sanitary Police Point of View.* We might continue to discuss for some time the heredity of Tuberculosis, and might demand whether the progeny of tuberculous parents are born *tuberculised*, or, rather, more *tuberculisable* than other offspring; but it is no longer possible to entertain any doubts as to the dangers with which tuberculous cattle threaten their neighbours and their descendants. Such animals expel the virus by the respiratory and digestive passages, and by the mammary secretion. The virus may infect healthy creatures when introduced into their digestive apparatus with the food or drink, or

* A paper prepared for discussion at the late International Veterinary Congress held at Paris.

through the respiratory organs with the air. Oft-repeated experiments made by men in whom confidence can be placed, have put these facts beyond all dispute. Therefore it is logical to adopt measures to oppose the propagation of Tuberculosis by the tuberculosed; and the first measure is to include this malady among those which in every country are combated by sanitary police regulations. This measure figures as No. 3 among the resolutions presented at the Brussels International Congress by Herr Lydtin. Pressed for time, however, the measure could not be discussed, the members being more preoccupied with the alimentary hygiene of man than contagion from animal to animal; and by a deviation somewhat frequent with minds hurried and absorbed by a particular point of view, they did not perceive that the measures concerning the alimentary hygiene should be the corollary, and not the premises of those with regard to contagion.

The question, therefore, remains to be studied, and it more or less occupies our confrères in every country. It was specially examined in 1885, by the second National Congress of French Veterinary Surgeons, meeting as a Sanitary Congress; and after a long discussion it was decided, by twenty-eight votes against seventeen, that the Government should *include Tuberculosis among the diseases inscribed in the law of July 21st, 1881, on the sanitary police of contagious maladies.*

The French Government, taking this decision into consideration, on November 12th, 1887, added bovine Tuberculosis to the list of contagious disorders, in the decree which rendered the sanitary police law of July 21st, 1881, effective in Algeria. Lastly, in another decree of July 28th, 1888, this malady was inserted amongst those amenable to the sanitary law in French territory. Consequently, at the present time bovine Tuberculosis is the object of repressive measures in France and Algeria. The general terms of the law, which compels the owners of animals affected with a contagious disease, or veterinary surgeons authorised to attend them, to declare its existence, and forbids these animals being sold or moved without previous authority, are also applicable to Tuberculosis as to all other maladies officially recognised as contagious.

The administration has, besides, given in detail the measures which it is desirable to employ against the disease. It is well that the Congress should know that these measures are not absolutely identical in France and Algeria.

In Algeria, in a case of Tuberculosis, the Mayor or Administrator of the Commune issues an order for the destruction of the animal, and the flesh must not be used for food. In France, every animal recognised as tuberculous is isolated and seques-

trated, and can only be moved for slaughter, which takes place under the supervision of the sanitary veterinarian. With regard to the flesh of tuberculous cattle, its consumption is sometimes permitted under certain conditions to be alluded to hereafter.

The Congress will doubtless observe that these measures, although different, will have the same result. An owner cannot keep a tuberculous animal isolated and sequestrated for an indefinite period, and as he can only move it for slaughter, he promptly demands this measure.

In Algeria slaughter is compulsory, while in France the administration indirectly causes the owner to apply for it. The *modus facienda* employed in Algeria may, *à la rigueur*, legitimise a demand for compensation; while the *modus* adopted in France may lead the administration to believe that the owner has no claim against it. And, rigorously, this thesis may be maintained; for a tuberculous animal is a source of danger to the property of other owners, and it is not permissible to anyone to do damage. If the damaging animal is not voluntarily disposed of by its owner, then society should require its destruction.

But a more conciliatory thesis has been at times upheld, and even by Lydtin at Brussels; most frequently, he insisted, the disease is introduced into a cowshed unknown to the proprietor, who is therefore the victim of a pre-existent contagious disorder; so that in compelling him to make a sacrifice for the public good, society should recoup him a portion of his loss. Besides, in order that the law should be efficacious, the owners of tuberculous cattle should not have to militate against their own interests in submitting to the obligation of declaration, and the only way to diminish their resistance is to establish the principle of compensation in cases of slaughter.

Nevertheless, it appears going too far to render the State alone responsible for a condition of affairs which is often brought about by the carelessness of owners; it is, therefore, to the principle of mutuality that recourse must be had, and this principle can be applied by the State. And it would be equally excessive to allow vicious speculation to falsify the principle of compensation.

But I anticipate the privileges of the reporters on the third question, whose mission it was to find the means of practically assuring the payment of an indemnity in the case of compulsory slaughter to prevent the extension of a contagious disease; though it is my duty to indicate, as well as I can, the probable burdens which the compensation fund would have to bear with regard to Tuberculosis, in order to throw light on our decisions.

Lydtin made strenuous efforts to fix the attention of the Brussels Congress on the frequency of bovine Tuberculosis,

and his investigations are very interesting, especially those with regard to the Grand Duchy of Baden, and the figures he obtains from Göring as to Bavaria, as they refer to all the animals in these countries.

Phthisis more particularly affects cattle aged from three to six years, and should be more frequently observed in the abattoirs than in the country cowsheds. In Bavaria, the proportion of tuberculous animals noted at the Munich abattoir is as high as 12·5 per 1,000; it is no more than 1·6 throughout the country. In the Grand Duchy of Baden, the proportion is 8 per 1,000 among the animals killed for food, and 2·2 per 1,000 among the cattle generally of the whole Duchy. Lydtin did not omit reckoning those cases which are unobserved, and those also which are dissimulated; and on the whole he concludes that 4·5 per 1,000 of the entire bovine population is affected with Tuberculosis in the Grand Duchy.

The statistics collected in Bavaria and Baden have also demonstrated that the disease was very inequally distributed in regions, and even in districts.

It is known that for some time inquiries of the same kind have been made in different parts of Europe, and it is therefore probable that the International Congress will see collected valuable information. Indeed, in France the elements of a statistic are already derived from the registers of the abattoirs inspected by veterinary surgeons, and the following are to hand.

In the abattoirs of Bordeaux, according to M. Baillet, the proportion of cattle tuberculous in every degree, is 2 per 1,000.

At those of Rouen, according to M. Veyssière, the proportion was, from July, 1884, to the same month, 1888, 1·43 per 1,000; 15 cases a year in 10·500 animals. During 1888, there were 23 cases among 12·174 bullocks, cows, and bulls.

At Montauban, according to M. Bayron, in a period of six and a half years, among 15·483 cattle slaughtered, there were noted 63 (4·07 per 1,000) which were affected with generalised Tuberculosis; those affected with the localised disease were not reckoned.

At Lyons, among 50,000 oxen, there were about 50 tuberculous: 1 per 1,000.

In Paris in 1882, of 260,000 adult bovines, only 11 were rejected, 684 being accepted which were only affected with local Tuberculosis. Including all the cases, the proportion is 2·60 per 1,000. The statistics collected in the abattoirs of La Villette and Grenelle by M. Villain, have given a proportion of 6 per 1,000 of 500,000 bovines slaughtered every year in the abattoirs of Paris, or 3,000 animals affected in various degrees. Paris receives more than forty million kilogrammes of flesh annually, derived from

about 100,000 animals; for this last series the proportion is certainly 10 per 1,000.

In the Lille abattoir, the proportion of tuberculous adults has been 1·05 per 1,000 in 1882 and 1883 (Vittu).

In the Melun abattoir, during the four years from 1884 to 1888, the number of the tuberculous has been 4·31 per 1,000 of 5,766 animals (Barrier).

At Cambrai, during eight years, M. Cartier has observed five cases of Tuberculosis among 1,000 cattle slaughtered.

In a note from M. Morot of Troyes, in the statistics collected between October 1st, 1884, to February 28th, 1889 (four years and five months), it is shown that Tuberculosis has been remarked in 4 bullocks, 8 bulls, and 299 cows (in all 311 bovines), of 2,000 bullocks and bulls and 21,000 cows (23,000 animals slaughtered); which gives a proportion of 14·5 per 1,000. Specific tubercles were observed in a calf of eight months, 44,000 calves having been slaughtered.

At St. Etienne, M. Labully examined 12,978 carcases of cattle in 1888, of which he ordered the total seizure of 25, and the partial seizure of 35 others, because of their being tuberculous; or a proportion of 5 per 1,000.

From these figures, it results that we may estimate at 5 per 1,000 the proportion of tuberculous amongst the adult bovines in France. It might, doubtless, be objected that the information is derived from inspected abattoirs, and that it is a matter of public notoriety that animals suspected of being tuberculosed are not sent to these establishments. This is true; but if the proportion of the tuberculosed is greater among the animals slaughtered elsewhere, it is much lower among the general bovine population. We have already seen the results of observations made in the Duchy of Baden. Thus it appears reasonable to accept the average proportion of 5 per 1,000.

Let us calculate the number of affected animals in the whole of France, in taking for granted that the malady is somewhat uniformly spread throughout the land.

According to the Agricultural Statistics of the Minister of Agriculture, there were on the French farms on December 31st, 1887, 8,623,441 adult bovines. This number may be raised to 9,000,000 for the whole of France, if we include those kept elsewhere than on farms; and if we admit a proportion of 5 per 1,000 of tuberculous adults, we shall see that the number affected with the disease is 45,000. The average value of each of these animals being 300 francs (£12), the amount of compensation to be awarded in case of compulsory slaughter would be 9,000,000 or 6,750,000 francs, according as this is fixed at two-thirds or

one-half the value, if we could at once discover and kill all the diseased. But it must not be lost sight of that this sum would necessarily be divided, owing to the indefinite number of slaughterings, and that in each year there would be a gradual reduction.

We may add some information with regard to other countries of Europe.

In England, M. Cope states (Congress for the Study of Tuberculosis) that the proportion of tuberculous animals is from 1 to 26 per cent., according to the locality.

In Belgium, according to M. Van Hertsen (*Ibid*), the proportion is 4 per cent.

In Holland, M. Thomassen reports (*Ibid*) the proportion to vary between 8, 4, and 19·6 per 1,000.

At the Augsburg abattoir, the proportion was, in 1887, 3·62 per cent. among adult cattle and 0·013 per cent. among calves.

It has been mentioned above, that at the Congress of French Veterinarians in 1885, a minority did not vote for the immediate inclusion of Tuberculosis in the sanitary police law on contagious diseases. Impartiality renders it a duty (otherwise easily complied with) to give the reasons which swayed our honourable colleagues. Their timidity proceeded from the difficulty in diagnosing bovine Tuberculosis.

In the report of the Brussels International Congress will be found a review of the diagnostic signs of Tuberculosis by M. Lydtin. The reporter remarks, in concluding, that veterinary surgeons too often wrongly exaggerate the difficulty in diagnosing this affection. The attentive breeder is able to select tuberculous animals in his herd; and it might be expected that the veterinary surgeon, who is armed with more extensive theoretical knowledge and more numerous means for investigating disease, should be as competent to act as the farmer. It is true that the latter has the animals under his eyes for a long time and proceeds slowly, while the veterinary surgeon is required to make his diagnosis with certainty in a short time.

Nevertheless, we think with Lydtin that this should not be a cause of discouragement, but rather a reason for examining the question on every side, and for perfecting our means of diagnosis. So it has been understood by several of our confrères, a *résume* of whose labours in this direction we may give.

The lesions of Tuberculosis may be evolved in every one of the organic systems, but we need scarcely occupy ourselves with these beyond thoracic and abdominal Tuberculosis, in connection with which comes Tuberculosis of the lymphatic glands, superficial or deep, Tuberculosis of the mammæ, bones, etc.

To establish the diagnosis of the pectoral form, some persons

believe that the ordinary clinical signs may suffice, if not to recognise the advent of Phthisis in any sick animal, at least to discover cases of Tuberculosis in a shed where it is known the disease has shown itself. M. Grissonnanche thinks that, except contagious Pleuro-pneumonia, the non-tubercular diseases of the pleura and lungs are rare in the ox; so that if in a bovine there are observed irregular respiratory movements, especially during inspiration, a rough *bruit* due to pleural friction, a small hacking cough difficult to provoke by compression of the trachea, exaggerated sensibility of the costal region on percussion, and tumefaction of the retro-pharyngeal glands, we may conclude it is a case of thoracic Tuberculosis. Starting with this fact, M. Cagny demonstrates that the diffusion of the disease readily takes place in a shed which contained a sick animal, and considers as suspected every animal which exhibits symptoms of illness or any indisposition whatever, as well as every animal which does not thrive on the food it receives. The veterinarian should therefore examine with the utmost care every suspected animal; more particularly should he hear it cough, and then proceed to examine the chest. There is nothing absolute in the emaciation which usually accompanies pulmonary Tuberculosis, says M. Cagny; on the contrary, it appears to him merely relative to the condition of the other animals in the same shed. It is necessary to compare with each other the animals submitted to the same hygienic conditions.

M. Cagny also recommends examining the degree of adherence of the skin to the subjacent tissues, by means of a needle or the sharp point of the cannula of a hypodermic syringe. In a phthisical animal, the cannula is pushed with difficulty between the skin and the subcutaneous connective tissue.

The pulmonary lesions are nearly always accompanied by great swelling of the bronchial lymphatic glands; then to the preceding symptoms are added intermittent indigestion, characterised by tympanitis, difficult respiration marked by stertorous breathing, and obstacle to the venous circulation demonstrated by jugular repletion or the venous pulse.

(*To be continued.*)

CONTAGIOUS PLEURO-PNEUMONIA IN GOATS AT CAPE COLONY, SOUTH AFRICA.

BY D. HUTCHEON, M.R.C.V.S., COLONIAL VETERINARY SURGEON, CAPE OF GOOD HOPE.

In a report on a fatal disease among goats in the district of Khandeish, by Principal John Henry Steel, which appeared in the

Veterinary Journal (No. 171, p. 153), he refers to a report of mine on "Contagious Pleuro-pneumonia in Goats in Cape Colony," which appeared in the same Journal a few years ago (No. 13, 1881, p. 171). As that report was written at an early period of the outbreak of the disease referred to, it was, in consequence, very incomplete. I beg leave, therefore, to supply a little additional information respecting it, taken principally from my report to the Cape Government after the disease had been entirely suppressed in the colony.

I will not occupy space by giving a detailed account of all the experiments conducted during the progress of that virulent scourge, but I will simply state the facts which these experiments elicited; and as the disease has ceased to exist in South Africa, I will refer to it in the past tense.

(1) *Respecting the nature of the disease.*—It was a specific infectious form of Pleuro-pneumonia, affecting goats only, cattle and sheep remaining free from infection, although constantly exposed to it. The disease was introduced into the Cape Colony by a shipment of Angora goats from Asia Minor, where the disease is represented as being indigenous.

(2) *The manner in which the disease was spread.*—The disease was carried from flock to flock by the near contact of affected and healthy goats, a very limited space being sufficient to prevent it spreading from the one to the other. In fact, I had no proof that the disease could be communicated in any other manner than by the immediate contact of the diseased with the healthy. Neither kraals nor camps appeared to retain the infection after the disease had ceased in the flocks frequenting them.

Healthy goats placed amongst an infected flock one month after the last case of disease occurred in it, became affected with the malady. These were immediately destroyed, and the same test applied in another flock two months after the disease had ceased. In this experiment the healthy goats remained free from any symptoms of the disorder. In fact, with one exception, in which the history of the flock could not be correctly ascertained, there was no re-appearance of the disease due to the introduction of healthy goats into a previously infected flock, although numbers were so introduced after it had ceased from three to six months only.

(3) *Respecting inoculation as a preventive.*—The following statement will indicate its value:—

The total number of goats inoculated was	...	44,000
The total number inoculated a second time	...	20,000
The total number inoculated a third time	...	1,600
Total number of inoculations	...	65,600

The number of flocks which were affected with the disease, and in which no inoculations took place was 19, containing a total of 7,500 goats; of these 5,100 died of the disease.

The number of flocks which were inoculated *after* the disease had appeared amongst them was 12, containing a total of 12,550 goats. Of these 4,380 died.

The number of flocks which were inoculated previous to any disease appearing amongst them, but in which it subsequently manifested itself was 35, containing a total of 21,500 goats. Of these 2,860 died of the disease.

The number of flocks which were inoculated, which were free from disease at the time of inoculation, and in which no disease followed was 18, containing a total of 9,950 goats.

From the foregoing statement, it will be apparent that when the disease was allowed to run its course in a flock, unchecked by any preventive measures, about two-thirds died. When inoculation was resorted to as soon as the disease was observed in a flock, less than one-third died. The average number, it will be observed, is higher, but that is due to the fact that very few flocks were inoculated on the first appearance of the disease amongst them; a considerable number were generally affected before inoculation was resorted to, especially before the beneficial effects of inoculation became generally known.

Of six healthy goats inoculated and placed immediately after the operation in a flock of goats in which the disease was raging, five took the disease and died, and only one escaped the infection. Of seven healthy goats inoculated, and kept for twelve days before being placed in a flock of diseased goats, one only took the disease, the remaining six showed no symptoms of it.

It will be observed that a comparatively large number of goats died, even in those flocks which were inoculated previous to the appearance of any disease amongst them. The mortality under this heading occurred principally in ewe flocks. In ewes considerably advanced in pregnancy, inoculations communicated the disease to the fœtus, and abortion followed. Many of these kids were born alive; they would linger for a few days, and die of the disease. The inoculation was thus the means of introducing the disease to thirty-five flocks, principally through the medium of the diseased kids. This led to the discovery of another very important fact, viz., that the preventive effects of inoculation only lasted from four to six months. As soon as this fact dawned upon me, I recommended the re-inoculation of all flocks in which the disease re-appeared, and the prompt slaughter of all that became affected. This plan proved a complete success, except in one instance, which I will here relate. The disease

made its appearance at a farm called Groonkloof, in the Waterkloof district of the Fort Beaufort Division, on September 20th, 1881. There were 1,460 goats on the farm, belonging to three different owners. Mr. Hartzenberg owned 1,000; Mr. du Preez, 260; and Mr. Heath, 200. The disease appeared in Mr. Heath's goats. I inoculated the three flocks on September 23rd. The disease passed through Mr. Heath's flock, carrying off about the half of them, but no disease manifested itself in Messrs. Hartzenberg or Du Preez's goats until some time after, when individual cases began to occur. I then re-inoculated these two flocks, using a large dose of virus, and was considerably disappointed to find that even then the disease did not subside. I then inoculated them a third time, again using a large dose of virus, when, to my dismay, on examining the flock a fortnight after, I found that nearly every goat was coughing and exhibiting slight symptoms of the disease. About one hundred took the malady in a severe form. These were picked out and destroyed. The disease, however, kept lingering in this flock, although very few died of it, until July, 1882, when twelve cases occurred in about as many days. The disease had been practically stamped out in every other flock in the Colony, several months prior to this. Authority was, therefore, obtained, and the whole flock was killed, and their carcases buried on August 8th; the scourge has not appeared since.

In my opinion, I communicated the disease to this flock direct, by using too large a quantity of virus in the inoculations. This opinion was confirmed by direct experiment, for I found that I could communicate the disease to a large percentage—3 in 12 inoculated—by injecting a large quantity 12 minims—of the virus. The disease was also communicated to a large number by taking a small wine-glassful of the fluid found in the chest of an infected goat, and administering it as a drink to a healthy one. Again, I inoculated other two small flocks of goats three times. In the first two inoculations, I used about five minims of virus to each inoculation, and about eight minims the third time I inoculated them. Two kids only became affected in these flocks; these were killed, and no further indications of the disease appeared.

Many mistakes were made during the course of the plague, but which could hardly be avoided, as I was working tentatively for a considerable time. The following are the directions which I gave in my report upon the subject.

In preparing the virus, select a goat which appears to be suffering from the disease in the acute stage, just when it commences to give the peculiar grunt at each expiration. After cutting its

throat and allowing it to bleed, open the chest by running a knife through the cartilages of the ribs on each side of the sternum, taking care not to cut through the blood-vessels entering the cavity. Lift off the sternum, then turn over the goat and pour out the fluid contained in the thorax into a dish. After doing this, cut out the diseased lung or lungs. If the diseased lung is suitable for inoculation, it will present a bluish state-colour, and be in juicy condition when cut through with a knife. Any portions that have a dirty yellowish-grey appearance must be rejected. But when degenerative changes have taken place in the diseased lung, it becomes dry; so that little virus can be obtained from it.

There is no thickening of the interlobular tissue in the diseased lung of the goat, and which forms such a striking feature in Bovine Pleuro-pneumonia. The section of a diseased lung in the goat has the appearance of a somewhat granular-looking liver.

In expressing the virus from the lung, I cut it into thin slices, and expressed the juice from these through a piece of open sacking. I then re-strained both the fluid expressed from the lung and also that obtained from the thorax, through a piece of muslin, mixing them together.

I used a small hypodermic syringe with strong needle points, for inoculating; injecting the virus under the skin of the inner surface of the tail.

If the goats are free from disease at the time of inoculation, use five minims of the virus for a first inoculation. If they are still exposed to the infection, re-inoculate them in from one to two months' time, using eight minims of the virus for the second inoculation. Should the disease be present among the goats, previous to inoculating, it is better then to use about eight minims of the virus, as a second inoculation is not required.

History of the disease in Cape Colony.—The disease appeared amongst Mr. Van Vickerks' goats, in the Bedford district, early in March, 1881. Three days after, when I arrived at the conclusion that the disease was both special and contagious, I recommended the immediate destruction of the affected flock, but the Government did not see its way to carry out such a policy. Very soon the disease extended to a large number of flocks, after which the farmers did not think it possible to eradicate it. Seeing that there was little hope of getting the Government to carry through a stamping-out policy, I set energetically to work to try to arrest its spread by means of inoculation. Meanwhile an Act was passed empowering the Government to order the slaughter of infected goats; but no compensation was allowed in the case of animals affected with the disease. Com-

pensation was only authorised when it was considered necessary to destroy healthy animals. The result was that the Act was comparatively useless. No "Board" would order the slaughter of infected animals without having the power to grant compensation.

So matters remained until October, 1881, when, by persistent pegging away, I got a deputation to meet the Commissioner of Crown Lands and myself. At this meeting, I showed that the disease could be stamped out at a very moderate cost, if I was allowed to adopt a certain course. He granted the request of the deputation, and authorised me to proceed in the manner I had indicated, which was as follows:—

Where the disease appeared in a flock which had been inoculated, we immediately selected all affected goats, and had them destroyed, re-inoculating the whole of the remainder. Any goats that showed signs of the disease after the second inoculation were also promptly destroyed. In every instance except the one already described, this second inoculation arrested the further spread of the disease almost immediately. Where the disease appeared in a flock which had not been previously inoculated, we had the whole flock slaughtered immediately. In this manner, 3,531 goats and 2,311 kids were destroyed, and the disease was practically arrested by the end of December of the same year.

As already stated, Messrs. Hartzenberg and Du Preez's flocks were destroyed on the 8th of August following, these being the only flocks in which the condition lingered. This brought the total number of goats and kids slaughtered up to 6,640, at a cost to the Colony of about £4,000, including the cost of services of a special Board and extra police.

I may just add that goats are very subject to a non-specific form of Broncho-pneumonia when exposed to cold, rains, etc. It is, however, perfectly distinct from the Contagious Pleuro-pneumonia above described.

SUCCESSFUL OPERATION FOR THE CURE OF LARYNGISMUS PARALYTICUS, OR ROARING, IN THE HORSE.

BY J. S. BUTLER, V.S., PIQUA, OHIO, U.S.A.

At the request of Messrs. Dye and Stillwell, importers and breeders of Shire horses, Troy, Ohio, Dr. T. J. Pence of that place secured a roarer and wished me to operate on him for the cure of that disease as an experiment. Never having operated on such a case,

or seen one operated upon, we thought it best to invite several veterinarians to be present, and assist in and witness the operation. The 12th of June was the day fixed upon for the operation, and the following veterinarians were present:—Drs. W. R. Howe and W. Shaw, Dayton; J. Charlesworth, Springfield; W. A. Labron, Xenia; A. H. Logan, Bellefontaine; A. V. Derr, Sydney; T. Kerr, Urbana; T. J. Pence, Troy; J. S. Butler, Piqua.

I was assisted in the operation by Drs. Howe, Dayton, and Charlesworth, Springfield; Drs. Kerr, Urbana, and Logan, Bellefontaine, administered the anæsthetic. The subject was a gelding at least twenty years old, and in an emaciated condition. He had a chronic discharge from the nasal passages, with considerable rattling in the head and trachea. The least exertion would cause very loud roaring, and upon being severely exerted the animal would stagger and nearly fall down if not stopped. The readers of this article will no doubt agree with the writer that this was not a very favourable subject for the operation.

The animal was thrown down and secured, and a suitable stage of anæsthesia was reached in about ten minutes. The hair was clipped as closely as possible over the region of the larynx, the skin was sponged with a solution of hydrarg. bichlor., then an incision about five inches in length was made in the median line through the skin and muscles, exposing the larynx and trachea. The hæmorrhage was controlled by cold water sponging and torsion of some small vessels. When it had entirely ceased the larynx was opened, including the first two rings of the trachea. A considerable quantity of mucus, mixed with pus, escaped from the wound, coming up from the trachea and bronchi.

The true cause of roaring in this case was fully demonstrated, as the left arytenoid cartilage was perfectly immovable, while the right arytenoid was in a normal condition, and expanded and contracted at each respiratory act. The left vocal cord was severed from its anterior attachment, and it, with the arytenoid cartilage, was entirely removed. All partially detached pieces of tissue and shreds of mucous membrane were taken away by means of curved scissors. As the hæmorrhage was slight, it was not thought necessary to pack the trachea. What hæmorrhage there was was controlled by cold water, antiseptically treated with hydrarg. bichlor., and applied with small silk sponges attached to the end of pieces of whalebone. The wound was left open, as advised by Dr. Fleming, and the operation throughout was conducted as near as possible to his description of it in his work just out. After the animal had sufficiently recovered from the anæsthetic, he was allowed to rise and walk back to the barn.

A thin piece of gauze was tied around the neck, covering the

wound, and kept wet with the antiseptic solution, and a little of the solution was injected in the wound. No food or water was allowed for thirty-six hours, when a few swallows of water and some bran and oatmeal gruel was given him, which he swallowed without much difficulty. The throat was dressed antiseptically twice a day, and the diet was confined to gruel for several days, when a little grass was allowed.

On the ninth day after the operation, Dr. Pence and I threw the animal again and examined the interior of the larynx and wound. We found it in good condition, except in two or three places where the granulations were rather profuse. These we touched with a solution of argenti nitras, and continued the former treatment for four weeks, when the wound was about healed. Then a run of seventy-five yards was given him without producing any roaring.

A few days afterward, the wound having healed, the animal was turned out on grass, when the former owner one day, having a curiosity to know what condition he was in, went to the pasture without our knowledge, got on his back and galloped him all over the field, giving him a severe test, but without producing any roaring.

On July 24th, about six weeks after the operation, Drs. Pence of Troy and Charlesworth of Springfield, together with the writer, went to the pasture and tested him thoroughly by running him up hill and in every other way we could, but without producing any roaring. The respirations were somewhat harsh, which was unquestionably due to chronic thickening of the nasal and tracheal mucous membranes.

CONTAGIOUS PLEURO-PNEUMONIA CYSTS.

BY J. MC KENNY, M.R.C.V.S., DUBLIN.

A RECENT paper on the formation of cysts in the lungs of cattle suffering from Pleuro-pneumonia has been promulgated through the medium of the press.

The writer bases his theory on the fact that "in Contagious Pleuro-pneumonia the inflammatory lesions are of greater intensity than in ordinary forms of lung inflammation." No doubt the affected portion of the lungs usually in Contagious Pleuro-pneumonia become heavier than in ordinary forms of inflammation of these organs; but cysts do not occur when the extent of the intensity of the inflammatory lesions is the greatest, but, on the contrary, the more limited it is, the more frequently cysts form. Therefore it is not consistent with the whole facts of the matter to base a theory, relative to the formation of cysts in the lungs of cattle

suffering from Contagious Pleuro-pneumonia, on the fact that in the disease the inflammatory lesions are of greater intensity than in ordinary forms of lung inflammation, as cysts are not formed when the inflammation is acute or intense, but are the result of chronic torpid irritation, as indicated by the nature of the symptoms exhibited.

It is a well-established fact that ordinary inflammation of the lungs usually assumes the acute form, and Contagious Pleuro-pneumonia a chronic character; the period of incubation, as well as the symptoms of the diseases, verifying such to be the case; and the more acute the symptoms are, the fewer the cases of cysts. Whereas, in a large majority of cases in which, during life, the symptoms of Pleuro-pneumonia are not well marked, after death the cysts are found in their lungs. Thus the formation of cysts in Contagious Pleuro-pneumonia does not occur when the inflammation of the lungs approaches an acute character, being only formed when it is unusually chronic; and referring to the formation of other cysts, it does not occur in the acute stage of inflammation, but invariably takes place in the subsidiary, chronic, or reparative stage, as in the case of foreign bodies in various tissues, organs, and muscles; when they are becoming encysted, acute inflammation is not present.

External and internal influences cause inflammation of the lungs. By the former interfering with the action of the skin, particularly the sebaceous exudations, thereby preventing its important assistance to the respiratory organs, so as to produce overtaxing of the functional capabilities of the lungs; also noxious inhalations; whereas by the latter the organs are acted upon by agents in the system being eliminated by the lungs or lodged in them, thereby irritating the tissues, or making them a *habitat* for their development. The first are causes of the ordinary acute inflammation of the organs, whereas the latter is the case in Contagious Pleuro-pneumonia, it being due to organisms which may be taken into the system by the lungs only; but owing to our present limited knowledge of the subject not revealing to us the characteristics of the organisms of Pleuro-pneumonia, especially during the period of incubation, which varies from weeks to months, it would be mere supposition to state that it is or is not taken into the circulation, or that it is located in the lung tissue. However, it is certain that after a period (at present undefined) the lungs become affected, and it may be assumed that at this stage of the disease the microbes are being eliminated from the lungs, or they have made the organ a *habitat* for their active development. Under either circumstance they irritate the organ, which is indicated by

the animal having a slight cough. At first, when the cough is noticed, the irritation is so limited that, on *post-mortem* examination, and without the aid of the microscope, the change is not visible; but as the disease advances the cough is severer, the lungs becoming slightly congested in patches, which gradually become consolidated; and the closer and more rapidly they are formed the greater the irritation. When they coalesce, and the larger the extent of the coalescence, the quicker the disease advances, and the more certain the fatality. The reverse to the foregoing takes place in cases in which cysts occur; and judging from analogy, the formation of cysts may happen in Pleuro-pneumonia from the inactivity of the circumscribed congested parts acting as foreign bodies, which are encircled by chronic inflammatory products, just as a nail or any other extraneous substance would be. But as foreign bodies are not usually encased, and may only take place when the subject is one of that peculiar diathesis, or the alien substance, for some reason, not satisfactorily explained, does not cause the destructive process of inflammation attending most cases where a foreign body has been introduced. Therefore a feasible solution of the formation of cysts in Pleuro-pneumonia is: firstly, the affected animal's system may resist the irritation set up by the organism, by encircling it with white fibrous tissue; and, secondly, attenuated microbes may produce consolidation, encased as already described. These two explanatory probable circumstances may combine. The constitution of an animal may weaken the microbes, and the attenuated organisms be again introduced into a series of similarly constituted animals, which further weakens the microbes until they are rendered incapable of causing the disease in an acute form. And the fact that when cysts do occur the disease has much decreased in its virulency, supports this theory, and is elucidated by the study of bacteriology, which explains the increased or diminished waves of influences, and decimation of the pestilential micro-organisms; and how nature's ordinance and wise provision prevent them from annihilating man and beast, etc.

Thus, when deciding from *post-mortem* appearances whether an outbreak of Contagious Pleuro-pneumonia is of a virulent or mild type—provided the foregoing hypothesis be correct—the character and percentage of cysts discovered will much facilitate in arriving at definite conclusions, which knowledge contributes materially to the interests of stock owners and the public.

MANE-AND-TAĪL DISEASE OF THE HORSE, OR SEBORRHŒA SICCA OR PITYRIASIS (DANDRIFF).

BY R. W. BURKE, F.R.C.V.S., A.V.D., ATHLONE.

MR. EDGAR, commenting on this form of Mane-and-tail Disease of the horse in India, speaks of the "clinical evidence to be of far more value in dealing with questions of this kind in pathology," and after calling the disease "Ringworm," gives us the following evidence in the next page, under the heading of Semeiology, namely, that in the horse "the disease is generally confined to the hind quarters, chiefly to the tuberosity of the ischium, and extending downwards to the hock. In a few cases it may extend to the flank, and perhaps there will be an isolated patch or two on the thorax, but not frequently. In the ordinary squamous form of Ringworm any part of the body may be affected. I have noticed many cases on the side of the face, shoulders, withers, and back, where the saddle or harness might convey the spores to their resting-place" (the VETERINARY JOURNAL, August, 1889). In fact, the disease was seen to attack every other part of the body but the localities usually chosen by the disease with which we are dealing.

We quote from another source as to the characters of Ringworm in the horse. "Herpes tonsurans in the horse," say Friedberger and Fröhner, "is most frequent on the back, croup, flanks, and on the head. Each patch is of the size of a two-shilling piece, and is in general perfectly round. The hairs are either completely shed or are broken off. The shedding of the epidermis is marked, and frequently leads to a light crust-formation. The hairs which are around the diseased patches are easily pulled out, and those which grow subsequently are usually of a darker colour" (*Lehrbuch der Spec. Pathol. u. Therapie der Hausthiere*, 1886).

It is interesting in this connection to note a few characteristic points regarding the disease with which we are dealing, namely—

(*a*) It is often confined to the hairy parts, as the mane and tail in the horse, whereas Ringworm attacks all parts of the body indiscriminately. It is remarkable how the fungus selects the mane and tail always, and in this respect differs in no way from the fungus found in that disease (Pityriasis) seen in man, where it also attacks covered parts of the skin in preference, particularly the chest, scalp, pubis, etc.

(*b*) Its almost universal confinement to the hot weather. It has

been remarked by Mr. Edgar that "moisture favours this disease, which is generally prevalent in wet weather;" whereas we know that the Mane-and-tail Disease of the horse appears, almost throughout India, as a rule in March, or at the latest by April, and the rains do not begin till June or July of each year.

(*c*) Its cure is spontaneous during the winter. Ringworm is never so apt to get well of itself, in such numbers, on approach of each cold weather.

(*d*) The complete absence of any "increasing circles" always present in Ringworm. Not infrequently the eruptive spots in Ringwerm are crowded together, so that a more or less continuous patch of papules is formed, but at the outlying parts and in the early stages the circular character of the eruption can always be detected.

(*e*) Non-transference of the disease to the syces and soldiers who have the grooming of both healthy and affected animals, for half an hour daily during stables, throughout the year.

(*f*) *Apropos* of the fungus and its special characters, about which there seems to have been so much discussion lately, it is manifestly impossible to attempt to generalise from a single point, as it would become yet more difficult and misleading were it not for the well-founded belief that the disease is not dependent for its development upon this parasite solely, but upon the concurrence of many conditions of almost, if not quite, as much importance as its implantation in the cuticle.

Mr. Edgar refers to a fungus described by Mr. Haslam, and emphasises this officer's designation that it is the Ringworm parasite, that it acts as the tricophyton does, and is probably contagious by a method of "deep" inoculation. Of this suggestion there does not seem any improbability; for we do not know from what cases Mr. Haslam took his material for examination, there being so many kinds of skin disease in India, and cannot therefore either affirm or deny the identity of Mr. Haslam's fungus and the tricophyton which gives rise to Ringworm. Without attempting to say which parasite it was Mr. Haslam had to deal with, we do not hesitate to assert that a fungus known as the *Microsporon furfur* gives rise to the skin disease Pityriasis versicolor, *which is different from tricophyton present in Ringworm.* That Mr. Haslam's parasite was not the *Microsporon furfur* may be gathered from his description of it. Mr. Haslam (VETERINARY JOURNAL, March, 1889) says the fungus presents "hyphæ in which are seen conidia or spores," which he believes to be "identical with the fungi of the various Ringworms."

Mr. Edgar quotes authorities to show that the "achorion, tricophyton, and microsporon are *exactly alike*," and also that

"*Oidium lactis** is identical"—an opinion which recognises no difference between blastomycetæ and hypomycetæ in general, but regards them as of a common type. So that it is not easy to define which fungus is meant here.

After bringing forward the opinions of various writers on Ringworm, Mr. Edgar proceeds to give us "clinical evidence" to prove the "identity of *Tricophyton tonsurans*, *Achorion Schon.*, and *Microsporon furfur*." Sufficient it is for us to state here that the *Microsporon furfur* is distinct from both of these, not only in its microscopical features, but also in the clinical characters of the disease in which it has been noticed; for although it has been stated that the *Microsporon furfur* is similar to the tricophyton, it presents marked differences from the latter.

We are indebted to Mr. Edgar for putting this subject particularly before the profession, if only for the fact that it shows how often we leave behind us evidence of chief importance, because it does not pertain to the point which mostly interests us for the time, or from other causes. It is unreasonable to throw so much stress on one section of the disease, and rob what portion of our attention may fairly be assigned to the others, which are, I venture to believe, sufficiently encouraging to justify a further study of the clinical phenomena in this disease.

Differential Diagnosis.

1. Ringworm is never confined to the mane and tail with such regularity as is this disease, but the skin of the whole body is affected; whereas seborrhœa is almost always—at least, in its origin—a disease of the mane and tail in the horse. 2. Not infrequently the eruptive spots in Ringworm are crowded together, so that a more or less continuous patch of papules is formed; but at the outlying parts and in the early stages the circular character of the eruption can always be seen. 3. The Mane-and-tail Disease of the horse is attended with decided but not excessive itching; the latter will, however, depend upon the amount of folliculitis present. 4. Ringworm is more decidedly a local affection, unassociated with the constitution of the patient; whereas Steatorrhœa sicca, or Mane-and-tail Disease in the horse, we know, is associated

* Among the parasitic yeasts occurring as epiphytes upon the skin, the Saccharomyces capillitii met with in this disease exerts very little, if any, pathogenic effects. At one time this was known by the name of *Oidium albicans*, and considered to be a mould fungus allied to *Oidium lactis*. Little oval cells are formed by this yeast fungus, which are sometimes united in chains, and at other times growing into threads, resembling mycelia, which are several times as long as they are thick. These fungi possess no mycelium proper, nor as a rule do they produce spores. But in artificial cultivations spore-formation may be brought about by special conditions.—R. W. B.

with the constitution of the animal—with his method of feeding, the climate, and other causes. The latter disease is curable, moreover, by the use of diuretics and other agents, independently of local attack, which is hardly the case with Ringworm. 5. Mane-and-tail Disease in the horse begins in the hot weather, and ends each winter; and I cannot think the term Ringworm is a suitable one for a disease that runs a definite course. 6. When the hairs fall out over a patch (as sometimes happens in Ringworm) it is entirely covered again by the growth of natural or coarse hair; but in cases of long standing the hair in Steatorrhœa never recovers its full vigour of growth (witness the "stumpy" tail of the horse described by the Germans). 7. Veterinary surgeons in Australia have described an allied form of skin disease in the horse, so they tell us, which consists in the presence of "minute organisms in the cells of the cuticle and in the hair and its follicles." The Australian practitioners are among the first supporters of the parasitic theory. Mr. Haslam has recently become its most powerful exponent, and he carefully describes the characters of the fungus. In both their descriptions there is a complete absence of any feature at all resembling that found in the *trichophyton;* while with regard to the Australian practitioners' observation of "minute organisms" as the "essence" of the disease, some dermatologist has truly remarked that this fungus was "*Torula vulgaris,* which is present in all epidermic desquamations."

(*a*) The sudden onset of the Mane-and-tail disease, (*b*) its frequent recurrence after intervals of freedom, (*c*) its special liability to attack particular parts, (*d*) its spontaneous cure, and (*e*) loss of hair (alopecia) characterising its course are not symptoms that we are accustomed to meet with in the known parasitic affections of the type of Ringworm.

Tinea tonsurans has been successfully propagated by inoculation. In Mane-and-tail Disease "deep" inoculation is recommended, and even then no case of success has been hitherto recorded. It should be noted that the Mane-and-tail Disease of the horse may be masked by an attack of *Tinea versicolor.* That they are occasionally met with together is only what we might expect, since they are both diseases of hot countries, and especially India. The Mane-and-tail Disease is distinguished from Tinea tonsurans and Pityriasis versicolor by the character of the parasite, and by the definite course it runs and its subsidence, which are characteristic.

The Australian practitioners describe the disease in the horse as spreading sometimes along "the entire length of the back to the root of the tail," frequently seen in *Steatorrhœa corporis* of man,

which is also situated on the back between the shoulders, and extends down the central part of the lumbar region, etc.

Further, while we have never seen any formation of "rings" in Mane-and-tail Disease of the horse in India, I would observe that papules which have a tendency to spread at the circumference into the form of rings may be witnessed also in some forms of Steatorrhœa.

Finally, Mane-and-tail Disease of the horse may be mistaken for a rather rare disease sufficiently defined to require notice, namely, Pityriasis maculata et circinata of Bazin, for which Dr. Gustav Behrend, of Berlin, has suggested the name Furfuracea herpetiformis, which was for long thought to be Herpes tonsurans, and which Hebra and his pupils describe as acute Herpes tonsurans maculosis. It appears to be quite certain, according to the leading dermatologists of to-day, that this disease is not Herpes tonsurans, and that we have to do with a well-marked and independent disease of the skin.

The subject of this form of disease common to the tropics requires to be studied anew in its broader aspects, as well as investigated by the bacteriologist. Above all, the precise nature of the parasite requires to be accurately determined, and then the next step will be to determine whether the disease is communicable, for if not the parasite can only be looked upon as concomitant. As a matter of fact, the disease is not communicable by the ordinary methods of inoculation, and we have found that when it has been seen to be most prevalent among the horses not one case was witnessed among the syces and soldiers who had the grooming of the latter. Nor, so far as we know, has there ever been an instance of the communication of the disease from one horse to another standing in the same stable.

FRACTURE OF THE TIBIA IN A GREYHOUND.

BY FRED. C. MAHON, M.R.C.V.S., SOUTHREPPS, NORFOLK.

I DO not claim originality in this article, but simply state facts connected with a good and a speedy recovery, noting a few particulars of material interest relative to fractured tibia of the dog—"compound-comminuted variety." An aged bitch (greyhound). Whilst pursuing a hare, and most probably in turning, undue tension of the powerful femoro-tibial muscles, extension of the limb, and bodily weight combined brought about the state of things here alluded to; or the fracture was, as alleged by her owner, due to her having come in contact whilst running, with a stick or stubble in the course pursued on this occasion. However, such has little to do with the interesting case, its peculiar and marked symptoms

and extraordinary recovery, when I state that from the time the fracture occurred, to her placing her bodily weight upon the limb, no more than twenty-eight days elapsed ; and when, as alleged by authorities on fractures, as Haller, Paget, Duputyren, etc., that in the third stage of reparation which extends from the twentieth to the twenty-fifth day, the fibro-cartilage between the periosteum and bone, and that between or within the medullary canal, are both converted into bone, the external forming a ring-ferrule or clasp, and the internal a plug or peg, filling up the medullary canal, and together constituting the provisional callus, we see this state of things fully realised. Every care was taken of the greyhound by her master, she being warmly bedded, diet cool and nutritious, bowels regulated by Pil. Aloæ et Pot. Bicarb. and tonics, as Parish's syrup of phosphates, ferri sulph. et quinieae sulph. ; constant changing of patient when bed-sores began to appear to opposite side, and quietude carried out as far as practicable, formed the main outlines of medicinal treatment. Briefly, a *resume* of what was done surgically may not be uninteresting at this stage.

October 11th. Ends of fractured tibia (three as far as could be ascertained) closely approximated, animal being placed under the influence of chloroform.

On November 1st this was taken off, and the calico bandage eased by cutting, to allow of an examination of the parts beneath, caused by the rapid progress of my patient, and a desire to examine a wound which occurred at the postero-internal part of the hock, on the fifth day after fracture.

On November 4th I removed the calico bandage in its entirety, substituting belladonna tape, heated by an iron made warm and passed rapidly over ; the leg was enveloped in the same, and the leather bandage re-applied.

No disfigurement of the limb this day, November 8th, apparent ; bitch standing on it, bearing weight, and stretching, to ease her cramped body and muscles, after fixed position for so long.

Plaster of Paris bandage applied, overlaid with tow, saturated with Burgundy pitch, the whole enveloped by a strong calico bandage, the ends being stuffed with cotton wool to prevent them causing friction to any marked degree. This was allowed to remain until the 15th, when a leather bandage was applied, one corresponding to the leg, midway (femoro-tibial) longitudinally and in circumference, padded supero-internally with tow, a space one-and-a-half inches in length, same in diameter for point of "hock" to penetrate, also padded marginally ; space anterior to "hock" likewise, and laced by leather lace from top to bottom, which kept the leg as primarily semi-flexed, or, to be accurate, in

about the position as a sound animal rests weight upon ordinarily whilst at a walk.

I considered the case hopeless at first, but at the owner's special request, I made a trial of her as an experiment, and with gratifying results; we hope shortly to breed from her, as I advised her owner to do so, and not to risk another fracture by using same *for "coursing."*

A fracture is said to occur in three ways: 1st. By external violence operating upon the injured part; 2nd. By external violence producing such concussion upon the bone as not to break it where the force is applied, but at some other part; 3rd. By inordinate action of the muscles, as in broken back, and with some bones as the pelvis, thighs, shoulders, pasterns, leg, vertebræ, and of the face, and skull more frequently than others in the horse. In the dog, the leg and thigh bones. The bones of the young are less liable to fracture than those of the old.

Atrophy, and fragility produced by gradual inflammation, partaking of a chronic nature, degeneration of bone, as in Fragilitis ossium, and Necrosis, being among the chief predisposing causes. Having in canine practice employed the following adhesive agents as plasters, viz., Plaster of Paris, pitch plasters, belladonna, india-rubber, etc., I prefer Plaster of Paris, alternated with belladonna for dogs, especially for the larger ones, if worth treatment, and "pitch."

The value of medicinal agents as adjuncts to reparation is debateable; still, in some cases, salts of phosphates, iron, etc., do good.

Some authorities recommend in fractures that holes should be drilled in the fragments with the ordinary drill, and fixing the same in apposition with ivory pegs driven into the drilled holes.

This idea suggested itself to me when puzzled as to the most efficacious mode of proceeding, at first; but I am pleased such was not needed, though strong in the belief of the practical utility, and further trial of this ingenious idea.

Fracture of the tibia in the dog, as in most of the domesticated animals, is of an oblique nature, the compound-comminuted being highly dangerous, and except occasionally unsuccessfully treated. In the pig I have successfully set a fractured tibia; this animal, as a rule, makes a rapid recovery from fractures, and by many country practitioners it is not considered *infra dig.* to be worthy of attention. The œdema of the foot of the fractured limb is but slight up to the end of the first fortnight, and rapid setting of the limb being accomplished, true approximation of the fractured ends being secured, patience and perseverance of both the owner and myself brought about a condition of things highly satisfactory.

Editorial.

THE EXTINCTION OF RABIES.

We are again in the midst of an impassioned discussion on Rabies, and the measures required to limit or suppress that harassing disease. This time, as usual, the excitement has been roused or stimulated by the malady becoming more common in London and suburbs, and, as a consequence, deaths occurring among people from Hydrophobia, due to the bites of rabid dogs. The measures adopted are the ordinary perfunctory, irregular, localised, and therefore impotent and vexatious attempts with which we are so familiar. There can be no doubt that these feeble and useless efforts are due more or less to apathy to look upon the matter in a serious and sensible light, and also to sentimental notions entertained by the lovers of dogs against restrictions which are likely to cause inconvenience to themselves or discomfort to their pets. As Rabies is generally only communicated by the bites of infected dogs, the chief, and indeed the one measure to be most rigidly observed in extinguishing the disease is that directed against biting, by the enforcement of the muzzle regulation. The arguments employed by the sentimentalists against the use of this article need not be referred to here; suffice it to say they would, if applied to horses, forbid the wearing by these animals of harness, bits, or shoes. We now know sufficient of Rabies to affirm that it can be completely extinguished in a given period, if diseased dogs can be prevented wounding healthy ones; and in this the muzzle must play a conspicuous part, because if it is properly constructed, a dog wearing it cannot bite, and a dog at large without it should not be tolerated. Whether any special dogs should be exempted is a matter for consideration. Hitherto, exemption has only been sought for sporting dogs; and certainly, so far as fox-hounds are concerned, they need not be included in any muzzling order, inasmuch as they are most carefully watched, are kept isolated except when hunting, and are never allowed to straggle. There is not an instance on record in which foxhounds have been instrumental in spreading the disease, though they have been frequently infected by strange dogs while in the field.

It is to be hoped that the legislature will soon see fit to take this important subject in hand. For years we have insisted upon measures being adopted for the complete extinction of Rabies in these islands, and there should be little difficulty or trouble experienced in effecting this. Getting rid of such an alarming disease means not only freeing mankind and animals from the risk of infection, but it implies relieving dogs and their owners from the inconvenience and hardship of the present desultory, and all but useless regulations, which are constantly resorted to whenever an alarm is raised. Rabies should be an unknown disease in the United Kingdom.

FORAGE FOR MILITARY PURPOSES.

BY GEORGE FLEMING, C.B., LL.D., F.R.C.V.S., PRINCIPAL VETERINARY SURGEON OF THE ARMY.

(*Continued from page* 275.)

The experiments on the Continent, and particularly the success attending those in the German and Russian Armies, appear to have led to an earnest desire to perfect our system of foraging horses on active service; and a Committee was therefore appointed in 1878, to make inquiries into the various kinds of compressed forage used in foreign armies, or manufactured in this country, with a view to the best being adopted for the British Service. Such forage was to fulfil the requirements of field operations, in being—

1. Portable, both for carriage by land transport and on board ship.
2. Possessed of good keeping qualities.
3. Retaining the maximum of nutritive properties after the process of compressing has been carried out.
4. Being of a nature admitting of horses changing to or from their ordinary food, without avoidable risk.

Having been appointed a member of the Committee, which continued its investigations for three years, I can testify to the anxious care with which its investigations were conducted, and the caution exercised in arriving at conclusions. A large number of samples of forage of different kinds were submitted and examined, and among them various sorts of horse biscuits and compressed hay and grain. Of the biscuits, Barthe's, composed of oatmeal, pea-flour, rye-flour, and linseed meal, and which had been tried in the French Army and unfavourably reported upon, was not accepted for trial; but Spratt's biscuit, made up of wheat, oats, beans, maize, dates, and other ingredients, and the German Army biscuit (known as Warnecke's), the composition of which I have already given, were experimented with. Spratt's biscuit was tried in 1878 on horses of the Army Service Corps and 16th Lancers, and found unsuitable.

In view of the favourable reports published in Germany and Russia, the German biscuit was submitted to rather prolonged and extensive trials at Aldershot, Woolwich, and London, in 1879, on cavalry, horse artillery, and Army Service Corps horses, but the results were generally unsatisfactory. Experiments also made with a biscuit supplied by Colonel French (20th Hussars), were no more successful, and the Committee came to the conclusion that "cooked food in the form of biscuits is unsuitable for the horse's ration," because (1) of its too rapid assimilation, and, when given alone, of its insufficient bulk; (2) horses do not take it readily—some horses persistently refused to eat it during the seven days' trial; (3) it might find its way into the camp kettle; (4) its great expense, £18 to £28 per ton; (5) difficulty in carrying it; (6) tendency to produce internal derangement.

3. *Compressed Forage.*—The opinion of the Committee was well founded, and the first and last reasons given for rejecting this biscuit forage were quite sufficient, in themselves, to justify their decision. Horses will not perform hard work on cooked food, it would appear, and their ration must possess a certain bulk. Their anatomy and physiology are such that though they only eat a small quantity at a time in a natural state, yet they should be fed frequently, and their food should produce such a feeling of repletion by its volume as to satisfy the appetite.

The essence of a large ration might be given in a very minute quantity, yet hunger would not be appeased, and the animal would lose condition. Therefore it is not so much to concentration of the nutritive properties of forage for army purposes that we should look, as to compression of the

ordinary forage, and in such a way as to make it as portable and conservable as possible. Panification of the food will not answer, and especially for horses exposed to weather, and which have to undergo severe fatigue. Compression, after suitable preparation of the ordinary forage, was then decided upon by the Committee for experiment. What was known as "Davis' Compressed Forage," consisting of bales of hay and oats mixed, had been already tried in North China, Abyssinia, New Zealand, and South Africa; its only advantage was reduction in bulk, a ton measuring from 55 to 70 cubic feet. Its disadvantages I have alluded to. It was sought to effect a still further reduction in bulk by having the grain and hay compressed separately in smaller quantities, and in a form better adapted for distribution and digestion. The great improvement in compressing machinery, and in the art of compressing which had taken place, rendered this an easy matter.

A "grain-cake," as it was termed, was introduced by Captain (now Lieutenant-Colonel) Graves, 20th Hussars, and this appeared to be the most desirable form in which the grain food should be presented. But the Graves' cake was composed of crushed maize, oats, beans, and so many other ingredients of uncertain nutritive value, and so different to the ordinary forage, that the Committee decided to reduce the number of constituents, and to have a compressed grain forage of simpler and more reliable composition. A cake was accordingly prepared, per ration, as follows:—

Oats, crushed	7·25
Beans „	1·00
Linseed „	0·25
Hay, chopped	0·50

This grain cake was intended to replace the ordinary oat ration; and from its composition, and the fact of the grain being crushed, it was thought that 9 lbs. of it would be equivalent to 12 lbs. of uncrushed oats. Long-continued, extensive, and thorough experiments were made with it in the cavalry, artillery, and Army Service Corps, in stables and on picket-lines, and with the most satisfactory results. After being fed for a month on a ration of 9 lbs. of the cake and 8 lbs. of hay per diem, the horses looked well, though in some instances undergoing severe work. It was considered, however, that for the heavier horses especially the allowance was rather small, and particularly in camp. The grain appeared to be thoroughly masticated and easily digested—an important point when considering the condition of tired or old horses, or when time is scanty. With regard to diminution of bulk, this was also found to be fully achieved. One ton of the cake occupies 38 to 40 cubic feet, while a ton of oats requires 80 to 100 cubic feet; the reduction which can be effected in the ration (say 1 lb. per diem) is also an important feature in connection with transport. The composition of the cake is also such as should meet all the requirements of a typical grain food for hard-working horses, and is a great improvement upon the oat ration.

For facility of transport and issue, the crushed grain was made into rectangular cakes weighing 18 lbs. each—a day's ration for two horses; four or five of these being made up into a small bale, securely bound.

The keeping qualities of the cake were found to be good; it was sent to different parts of the world, kept there for a considerable time, then returned to England and examined, when it was found to have undergone little, if any, change.

In the words of the Committee's Report: "Horses thrive on it, take to it readily, and change to and from it, with reference to their ordinary forage, without detriment to health or condition."

In their inquiry the Committee were not unmindful of that other essential

portion of horse's food—the hay. The difficulties attending its provision, storage, and transport in the field; its inflammability, and its great tendency to become mouldy and otherwise damaged when exposed to wet and other influences; and the great loss sustained in issuing it and feeding it on the ground to horses; induced them to try chopped hay compressed into dense cakes, like those of grain, and of the same weight. The result was again perfectly satisfactory. When hay is cut into short lengths—about three-quarters of an inch—and pressed into cakes of this description, it forms not only a most convenient and very portable article of forage, so far as transport and issue are concerned, but its keeping qualities are greatly increased, while it is almost uninflammable, and is nearly waterproof. The saving in cubic space alone is something extraordinary; for while one ton of the ordinary compressed hay in iron bands occupies 135 cubic feet, one ton of the hay cake measures only 45 cubic feet. It was estimated—and the estimate was found, on experiment, to be correct—that 9 lbs. of hay cake (two rations in each cake) were equal to 12 lbs. of long hay; so that the amount of cubic space required for one horse's rations of the latter, would contain four rations of hay cake. When this chopped hay is given to horses in suitable nose-bags, there is no waste whatever; very different is it with long hay thrown on the ground before the horses in wet or windy weather. Mastication, too, is much easier, and there is not the risk of horses swallowing soil, gravel, and other injurious matters, as when they are fed on the ground. On the line of march, also, the immense inconvenience of carrying voluminous hay-nets suspended from the saddle is avoided.

By having the hay and grain separate, several important objects are attained. The horses can have a larger or smaller allowance of each; if hay or grass can be procured within the zone of operations then the hay cake need not be given. As the result of experiments at Aldershot, there is reason to believe that a force might be detached on a reconnaissance for four days, each trooper carrying four days' rations of grain cake (36 lbs.) in the nose-bag, supplementing this with whatever hay, grass, or straw might be obtained on the line of march; while an additional two days' supply might easily be carried in the squadron carts of regiments, and on the ammunition wagons of the artillery.

When horses are fed with the hay and grain cake, these should be mixed in each feed, as it saves time, and is more economical. To do this, however, a larger nose-bag is required; and one was devised by the Committee which answers the purpose admirably. As is well known, the present nose-bag is of very little use. It is so small as only to hold one feed of oats; is soon worn out by the ground (during the Zulu campaign the average wear of the nose-bag was a fortnight); owing to the horse tossing up his head to get the oats in his mouth, much is wasted; and the weight is entirely supported by the horse's head. The improved bag is sufficiently large to hold a full feed of grain and hay cake, or three days' rations of the former. When worn by the horse it is horizontal instead of vertical as with the present bag, and the weight is borne by the head and body. The bag never comes in contact with the ground, and therefore the amount of wear is so much diminished that it should last for a very long time. The comfort of the horse when feeding is very much increased—as he eats from the upper side of it; there is no fouling by the breath; nor is there any waste of forage, while the animal can breathe quite freely. By means of the cords attached to each bottom corner of the bag, and which serve to suspend it to the body, when it is filled with grain cake to be carried on short expeditions, it can be lashed to the saddle. This bag was also tried in the Aldershot experiments of 1880, and reported on most favourably by the different regiments.

I have alluded to the use of bran on shipboard and in the field, and to the

trouble and risk there is usually experienced in carrying and preserving it. When compressed into cakes, like the grain and hay, the trouble and risk are at once got rid of. It is easily carried, and if not exposed to much damp will keep for a very long time. One of the cakes of bran now before you, weighing 25 lbs. and containing two bushels, has been compressed for more than twelve months. I may mention that one ton of bran in sacks occupies 150 cubic feet, but when compressed into cakes it requires only 40 cubic feet, being a saving of 110 cubic feet per ton.

In every way this compressed forage has answered well, and has met all the requirements of an army forage. It is very portable, keeps well, is easy of issue, does not waste if properly given, is readily masticated and easily digested, contains the nutriment in a sufficiently concentrated form, while it possesses the necessary amount of bulk to prevent horses feeling dissatisfied when they are fed; is not very combustible; and it consists of the ordinary food of our horses.

As I have said, these cakes are made up into small bales, containing four or five cakes, covered with canvas and bound by light iron bands, and are well adapted for either wagon or pack-saddle carriage. They appear to be damp-proof, and are certainly bullet proof.

In addition to the extensive trials made of this forage at home, it has undergone satisfactory tests in Egypt and the Soudan, and also in India. In India the forage biscuit was tried in 1881, and failed; whereas the hay and grain cakes answered well, forming an excellent forage, and their keeping qualities were found to be good—a year's test having been imposed. I understand that the Indian Government contemplates preparing large quantities to be kept in reserve, and it is reported that the French Government look with favour upon this kind of forage, and are about to lay in large quantities of it. Considering this the best kind of forage for military purposes—that is for field service, it may be hoped that there are means in this country by which it could be readily supplied when needed. The machinery to prepare it cannot be extemporised in a few days, and if it is to be supplied by private firms, some demand for it must exist all the year round, for the reason that there would be no demand for it except for army purposes. The system of securing supplies of this kind for the army rather militates against the adoption of the compressed forage, as the tendency is towards extreme economy during peace, and extravagant expenditure in war-time.

In order to accustom the Commissariat and the horses to this war forage, and manner of using it, as well as to encourage manufacturers of it, a certain quantity should be used annually—say, not less than 1,000 tons—and a day's ration given to every troop horse once a fortnight, or even once a month; a stock to the same amount being always kept on hand for emergencies. I am strongly of opinion that everything done with, and for, men and horses during peace, should be in the nature of a rehearsal for war; so that there should be no confusion, dislocation, or defection when troops have to take the field.

Before a manufacturer of this forage can turn out, say from one to two hundred tons a week, he must spend a large amount of money in laying down machinery, and if this is not regularly employed, there is not only the loss of interest on the capital, but the machinery itself soon becomes damaged. Therefore, unless we are to find ourselves in an unpleasant fix with regard to forage should a war occur, we should not only have a good reserve supply on hand, in order to avoid having to pay a most exorbitant price if an emergency arises, but there should also be provision made for a constant supply to meet all demands of active service.

I should have liked to have referred at length to the supply of forage to army horses during peace, but time will not admit of my doing more than briefly noticing it. Those who, like myself, have given the subject some

attention, must have come to the conclusion that the present system is unsatisfactory in several respects, and that probably much improvement could be effected, and a large money saving made, if army horses were foraged on the principle in operation in large civilian establishments of horses, such as the omnibus and tramway companies. Take, for instance, the London General Omnibus Company, which at two forage depots prepares and delivers prepared food for more than 10,000 horses. The objection which would probably be raised to such a system is, that it would be impossible to prepare forage in London and deliver it at a distant station, say, Aldershot, as cheaply as it would be to purchase unprepared forage at that station. This objection might be met, however, by pointing out that such places as London, Liverpool, and Hull are the great centres for forage of all kinds, and its price everywhere else is governed by its price at these markets. For example, supposing a quarter of oats in London costs 15s., and the railway carriage to Aldershot is 1s., the market price at that place would be at least 16s. 6d. or 17s. per quarter, the extra amount being the merchant or contractor's profit.

Then again, buying in large quantities, as the Government would do, the supplies would be procured direct from the grain ships, and thus the factor's and merchant's profits would be saved.

The same argument would apply to the procuring of hay. The growers would be only too pleased to submit their samples, and, if approved, sell direct to Government as a consumer, at a price as low, if not lower, than to the hay dealers in whose hands they must place themselves, often not knowing how or when they will receive payment.

One other objection may possibly be raised, viz., that it would be detrimental to the English farmer if the Government were to purchase supplies in, say, the London market. But a simple answer to this would be, that under the present system Government buys from the contractor, who, in his turn, purchases from the London merchants. Foreign oats (the present contract prices are so low that none but the cheapest Russian oats can be purchased), or even those of home growth, the Government could buy direct, as the price suited. The advantage to the public and the horses would, I am certain, be very great, and we should get rid of bad forage, peculation, light weight, and all the other evils which cause so much trouble and dissatisfaction. As regards delivery of forage from the railways to the barracks, there should be no difficulty about this, as cavalry, artillery, and infantry have their horses and wagons.

I regret that time will not permit me to refer to the quantity of forage allowed to army horses, a subject of much importance, and which is well worthy of discussion; but I must forbear, and, in conclusion, ask you to aid in throwing as much light as possible on the different points I have been, by your kindness, allowed to touch upon in this paper, in order that our army may benefit to the largest extent from your experience and observation.

BACTERIOLOGICAL STUDY OF THE LESIONS OF BOVINE CONTAGIOUS PLEURO-PNEUMONIA.

At the *séance* of the Academy of Sciences of Paris, held on September 9th, a note was read from Professor Arloing, of the Alfort Veterinary School, on the above subject. He remarked that Willems and Van Kempen, in 1852, had signalised the presence of fine molecular granules in the exudate from the lesions of contagious Pleuro-pneumonia; but the first attempt to demonstrate the really microbic nature of the virus was made by Bruylant and

Verriest, of Louvain. In 1880 these two experimentalists thought they had found in the lungs of diseased animals a characteristic *micrococcus*, which they had cultivated in various broths. They, however, did not continue their investigations, which were forgotten until 1882, in which year Pasteur announced before the Agricultural Society of Melun that the virus of this disease was not cultivable in ordinary broths. Nevertheless, two years later, Pœls and Noles stated that the exudate of the diseased lung contained micrococci altogether like those which Friedlander asserted he had discovered in human Pneumonia; but the researches of Lustig (1885) did not confirm this statement. That authority had isolated from the lymph of freshly inflamed parts—1. A bacillus which liquefied gelatine; 2. A micrococcus, the colonies of which resembled boiled white of egg; 3. Another micrococcus differing from the preceding by the golden-yellow colour of its cultivations; 4. Lastly, another micrococcus, the cultivation of which on gelatine is similar to that of melted yellow wax. The latter microbe offered bacillary forms associated with round ones, in such a way that its most constant character is derived from its colour. Cornil and Babes have also touched on this subject; but the results they obtained were not very precise, for in 1886 they estimated that their researches were to begin again, and in this appreciation they embodied all the observations of the authorities who had preceded them.

Such was the state of the question when Arloing undertook his investigation. He observed that in the serum which flows from a cut made into a diseased lung, there are seen microbes which are few relatively to the importance of the lesions; they are in the form of very short bacilli, and isolated micrococci unequal in size, or associated two and two. The pulmonary serum being immediately spread on nutritive gelatine by means of a platinum thread or fine pipette, the colonies which grow from this sowing furnish four different kinds of microbe—1. A bacillus which promptly and completely liquefies the gelatine; 2. A non-fluidifying micrococcus, the white colonies of which resemble drippings from a candle; 3. A micrococcus whose white colonies are spread in a thin layer which becomes ridged and folded as it becomes old; 4. Another micrococcus in elongated or circular colonies, which assumes a fine orange-yellow tint. It appears certain that Lustig had isolated the first two, but he must have observed as Nos. 3 and 4 a mixture of the Nos. 2, 3, and 4 of Arloing.

Arloing proposes to name the first *Pneumo-bacillus liquefaciens bovis*, the second *Pneumo-coccus gutta-cerei*, the third *Pneumo-coccus lichenoides*, and the fourth *Pneumo-coccus flavescens*. It is possible that the *Pn.-gutta-cerei* and *Pn.-flavescens* correspond to the *Microc. cerens albus* and the *Microc. cerens flavus* of Passet; but Arloing could not assure himself of this by comparison.

A certain number of characteristics would go to prove that there are really four kinds of microbes in the serum from the lungs of cattle affected with contagious Pleuro-pneumonia. Thus, the two first mentioned are optionally ærobic and anærobic; the last two are exclusively ærobic. The *Pneumo-bacillus* vegetates only at 3·5° Cent.; the *Pneumo-coccus lichenoides* does not develop on potato, while the three others do so vigorously. And it is well to know that they offer curious examples of polymorphism. The *Pneumo-bacillus*, which is very short, sometimes half-round in broth, becomes elongated, slightly thickened, and regular in shape in gelatine. The *Pneumo-coccus gutta-cerei* increases in volume, and the *Pn.-lichenoides* becomes pseudo bacillary on solid media.

The micrococci are nearly always in union with the pneumo-bacilli in more or less large numbers, in all those points of the pulmonary lesions which are in a state of active inflammation, and even in the sequestra; but notwithstanding this co-existence, it is impossible to attribute to the four microbes an

equal share in the genesis of Pleuro-pneumonia, and it is probable that only one of them is the sole and essential agent of the virus.

Determination of the Microbe which Causes the Contagious Pleuro-pneumonia of the Ox.

Following up his paper read at the *séance* of September 9th, Arloing presented another to the Academy of Sciences on the 16th of the same month. In this he remarks that the determination or identification of a pathogenic microbe is complete when, by inoculation of its cultivations, we can reproduce the lesions from which it proceeded. Such identification is difficult to obtain in Pleuro-pneumonia, for up to the present time it has not been possible, except in rare instances, to reproduce the disease in the ox by intra-pulmonary inoculation with the natural virus or in any other way. The experimentalists have merely produced a local tumour in the loose subcutaneous connective tissue, which tumour extended slowly, and was often accompanied in young animals by metastatic synovites. Such a tumour invariably caused death by the products which the specific microbe secreted in its substance, and which were gradually absorbed into the system. If the animal chanced to survive, it became almost proof against further inoculations, and possessed immunity.

Arloing determined to reproduce with the cultures of the microbes described in his other paper, either the connective tissue changes abovementioned or the pulmonary lesions, but he did not succeed without having to overcome many obstacles.

Lustig having obtained, by the first inoculation of his orange-coloured microbe, a small fugaceous subcutaneous tumour, and by a second a still more voluminous tumefaction, thought he might compare these insignificant effects with those of the pulmonary serum, and surmised that this microbe was the producing agent of Pleuro-pneumonia. For Arloing the specific microbe is the *Pneumo-bacillus liquefaciens bovis*, and the following was the manner in which he proved it to be so:—

If half a cubic centimetre of the cultivation of each of the above-described microbes is inoculated at two different places in the connective tissue of a calf, at each point will be formed a flat, œdematous, hot, and painful swelling, which almost disappears in five or six days, only a somewhat persistent nodule remaining. The most extensive tumefaction is produced by the *Pneumo-bacillus*, then in decreasing order comes that caused by the *Pneumo-coccus gutta-cerei*, *Pn.-flavescens*, and *Pn.-lichnoides*. If several successive generations are inoculated, a time arrives when the *Pneumo-bacillus* alone produces a local effect. Inoculated into the lungs, the trachea, and the veins, the same cultivations have not given rise to Pleuro-pneumonia.

The results obtained in this way are certainly far from being like those produced by the fresh pulmonary serum, for all the microbes contained in that appear to lose immediately the greater part of their special activity by cultivation. Nevertheless, it may be remarked that the *Pneumo-bacillus liquefaciens* is that of which the cultivations produce phenomena most analogous to those of the fresh virulent serum. This is an argument in favour of Arloing's hypothesis, which becomes still more probable if it is added that the *Pneumo-bacillus* is found in all the diseased lungs, while one of the other three microbes is sometimes absent; and it also exists in the metatastic synovites which occur far from the subcutaneous tumour; while the general effects of its secretory products and of filtered pulmonary serum are similar.

These diverse considerations led Arloing to inquire whether pure inoculations of a more energetic Pneumo-bacillus might not give more satisfactory results. It had been noticed that the special activity of the pulmonary serum

could be increased if the microbes could be grown beneath the skin of a healthy ox; and in afterwards isolating the liquefying bacilli contained in the subcutaneous tumour, chance produced more active organisms than those obtained directly from the lungs. The cultivations Arloing made in this way were subsequently inoculated—(1) into the lungs and pleura; (2) into the veins of the ox.

In the lungs four centimetres produced immediately trembling, quickened respiration, cough, and hyperpyrexia. A month afterwards, at the autopsy of the animal, there were found false villous membranes on the visceral pleura, and centres of chronic Pneumonia disseminated in both lungs.

In the veins twenty centimetres caused the death of young bovines weighing from four to five hundredweight, in eight hours, after a series of very remarkable accidents. At the autopsy there was found acute congestion of the lungs, and all the intercostal spaces were infiltrated with serum, as in recent cases of Pleuro-pneumonia. Eight centimetres injected in two doses, at an interval of a few days, caused immediately accidents similar to the foregoing, but not so severe, and to them succeeded dyspnœa and intermittent digestive disturbance; during the first days mucus streaked with blood flowed from the nostrils. When the animals were killed at the end of a month, the bronchial and mediastinal glands were found to be swollen, while in both lungs there were observed scattered red or white patches with small pseudo-purulent nuclei, corresponding to the lesions described by writers as marking the chronic forms of epizoötic Pleuro-pneumonia. So that it did not appear doubtful, notwithstanding the rapid progress of the *processus*, that the pathogenic agent had been inoculated.

Arloing injected into the jugular of a calf, in thirty-six hours, twelve centimetres of natural serum containing the strengthened virus. In a few days the animal showed a single but very important localisation; the autopsy, made twenty-six days after inoculation, showed that the interlobular and subpleural lesions of the Pleuro-pneumonic lung were developed in the connective tissue of the external crural region. In addition, a great number of sowings on gelatine, made with the serum from these lesions, yielded only colonies of the *Pneumo-bacillus liquefaciens*.

Thus it appeared demonstrated to Arloing that, so far as his experiments went, the *Pneumo-bacillus liquefaciens* is really the living and essential element in the virus of bovine contagious Pleuro-pneumonia.

NOTES ON AN EPIZOOTY OF RABIES; AND ON A PERSONAL EXPERIENCE OF M. PASTEUR'S TREATMENT.*

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(From the Cambridge Pathological Laboratory.)

TOWARDS the end of July last, I was consulted by Dr. C. Scott Kilner, the medical officer of health for the Bury St. Edmund's district, concerning a disease which was rapidly carrying off the fallow deer at Ickworth Park, the seat of the Marquis of Bristol. The disease was supposed to be Anthrax, and as at that time some fresh Anthrax material was wanted for our laboratory work, I gladly availed myself of the opportunity to visit Ickworth along with Dr. Kilner, in order to make a *post-mortem* examination upon one of the dead deer, consent having previously been obtained from Lord Bristol's agent.

From the keepers and others at Ickworth, I learned that it was only through

* From the *British Medical Journal*.

the chance discovery of an unusual number of dead deer lying in the thick bracken that suspicions were aroused as to the presence of any disease. Living in a half-wild condition, deer do not lend themselves readily to accurate and continuous observation. When any member of the herd is ailing it leaves or is driven away from the rest of its fellows, and seeking some retired spot, dies in hiding. It is impossible, therefore, to state with any exactitude the time of onset of the outbreak.

From the beginning of July up to the 20th of the month, twenty-three dead bodies were discovered; during the next seven days, with more careful search of the whole park, ninety-two were found and buried; and now for the first time symptoms of illness were observed each day in a certain number of the does and young bucks (prickets). The fact that during this first period of the epidemic only does and young bucks were affected is worthy of note, although capable of easy explanation. For the greater part of the year the adult bucks keep themselves in separate herds away from the does, often, indeed, occupying a different region of any park. Accompanying the does are the prickets, or young bucks, which have not completed their second year, and the haviours, or castrated bucks. To this fact is probably largely due the difficulty of arriving immediately at a correct diagnosis of the true nature of the epidemic, or rather epizoötic. The symptoms of the disease which I was able to gather on my first visit were of a very indecisive nature. All that could be learned was that, leaving the herd, the animal affected—a doe, or fawn, or young buck—appeared uneasy and distressed, wandered about aimlessly, at times essaying a run, and then suddenly stopping short. As the disease progressed the gait became staggering, the hind quarters appearing specially weak, and finally the animal dragged itself into the bracken to die. Death occurred, as a rule, within thirty hours after leaving the herd.

Upon making a necropsy the blood was found dark and almost black, remaining liquid; the liver and kidneys were congested; the lungs unaffected; the spleen somewhat larger than normal, dark, almost black in colour, and very pulpy. Decomposition apparently set in with great rapidity. Incomplete though the *post-mortem* examination was (being made in the open during a heavy shower), all these symptoms and appearances seemed not opposed to the idea that the disease was Anthrax. I noticed at the time that the skin was not so congested as is usually the case in this disease, but considered that this symptom might be specially marked only in cattle suffering from Anthrax.

Returning to Cambridge, in the full expectation of finding Anthrax bacilli in the portions of the spleen, liver, and kidney that I had carried away with me, I was greatly surprised at being unable to discover in any part a single typical bacillus, notwithstanding the greatest care in the preparation of the specimens. Nor were the attempted cultivations any more successful. There were several growths of putrefactive micro-organisms, none of the Anthrax bacillus. Soon after this I learned that having obtained evidence of the presence of characteristic bacilli, the Privy Council had recognised the disease as Anthrax, and that the park had been officially declared an infected area under the Contagious Diseases (Animals) Act. This fact led me to conclude that I had perhaps been mistaken in my conclusions concerning the disease; I therefore thought it desirable to make further inquiries into the subject. In the meantime, in answer to certain questions addressed to Mr. Turner, Lord Bristol's agent, I obtained fuller information about the symptoms that had so far been noted. I learned, namely, that the keeper had observed the affected animals during the early stage of the disease to throw their heads back in a curious manner, to bite their shoulders, legs, and sides very frequently, at times inflicting severe wounds upon themselves; to jump up (rarely) and bite at the boughs of trees. Further, the gait might be described as becoming more and more "groggy," until at last the animal fell down—to rise again, proceed onwards,

and again fall—the hind limbs becoming increasingly paretic, until at last the animal died, death being very often preceded by convulsions. These symptoms are not those of Anthrax. The possibility of the disease being Hydrophobia having naturally occurred to me, it appeared desirable to make further necropsies.

On August 8th, with the aid of Professor Roy and in the presence of Dr. Kilner and Messrs. Johnson, senior and junior, the veterinary surgeons in charge of the diseased animals, I made two more *post-mortem* examinations at Ickworth upon a full-grown doe and a haviour respectively. Nothing very abnormal was found beyond what was seen in the first necropsy. We brought back to the laboratory sealed pipettes containing spleen juice and blood from the heart, which had been filled with the usual precautions, as well as gelatine test tubes inoculated upon the spot. We also preserved the brains and cords of the two animals.

On microscopic examination of the blood and spleen juice no bacilli were discoverable. No traces of the bacilli showed themselves in any of the gelatine tubes, nor again in the tissues could any typical Anthrax appearances be made out. It may be mentioned in passing that during the course of the second of these two *post-mortem* examinations I gave myself a slight cut upon the right index-finger with a knife which had been used to incise the brain and cord of the first animal. To this matter I shall shortly return.

To obtain proof positive of the nature of the disease, Professor Roy, to whom I have throughout been indebted for much kindly counsel and assistance, willingly made the necessary inoculations. His investigations, a report of which is appended,* proved to us conclusively that the disease from which the animals died was not Anthrax, bnt the paralytic form of Rabies.

But if further evidence were wanting, we obtained it towards the middle of August. The epizoötic, now no longer confined to the does, haviours, and prickets, began to manifest itself among the adult bucks, and we received information that they had been observed attacking each other and butting violently at trees. One animal was observed to chase a hare, another angrily snatching at and biting a large stone, while a third rushed upon one of the assistant keepers, who happily escaped. Again, it is to be noted that although a large herd of sheep and numerous ponies had shared the deer

* Note by Professor Roy.—The disease in question was officially declared to be Anthrax, but in accordance with Mr. Adami's views on the subject, it was decided that a rabbit should be inoculated from the brain of one of the deer at the same time that some of the blood of the dead fallow doe was introduced under the skin of one of the thighs. This was done by me on August 9th, 1889. A portion of the medulla having been rubbed up in a clean mortar with a small quantity of sterile decoction of meat, a small quantity of the mixture was introduced under the dura mater, which had been exposed by making a small trepan hole through the vertex of the cranium. The wounds healed by first intention. On August 27th this rabbit, which till that date had not shown any symptoms of disease, was found to be paretic, the weakness being recognisable chiefly in the hind limbs. It screamed for some time after being simply lifted on to a table, although this was done gently enough. On August 28th the paresis was much more evident. On August 29th, in the morning, the rabbit was, so far as could be seen, completely paralysed, with the exception of the respiratory muscles. It died on the afternoon of the same day. *Post-mortem* examination showed no noteworthy abnormality, although the brain and spinal cord were very carefully examined. On August 30th I inoculated two other rabbits subdurally from the medulla of the one which had died on the previous day. On September 15th one of these showed the characteristic paresis, and it died on September 16th with symptoms identical with those of the rabbit from which it was inoculated. The second of the two rabbits inoculated showed paresis on the 16th, and died on the 17th September. The conclusion is, of course, that the deer from which these animals were inoculated died of Rabies and not of Anthrax.

park until as late as July 20th, and one of the animals had been observed licking a dead deer, up to the present moment no symptom of a similar disease has evidenced itself among them. Were we dealing with Anthrax, this immunity would be fitted to cause surprise.

Rabies among deer had been almost wholly unknown until Mr. Cope published last year his excellent report upon the outbreak at Richmond Park. The manifestations at Ickworth agree in all important points with those described by him, save that I have never been able to observe or obtain a description of the removal of the hair from the forehead, as a result of continued forcible rubbing of the head against trees and posts. Ascending paralysis would seem here to be more frequent and to be specially common among the does, while it would seem to be mainly in the adult bucks that what may be termed the typical symptoms of Rabies, accompanied by great nervous excitation, make themselves evident. At Ickworth also the disease has spread to all the separate herds of deer, and we have the interesting though lamentable sight of Rabies, not in a series of isolated cases, but as a well-marked epizoötic. Since the disease was first observed, less than three months ago, over 450 animals have died in a herd of between six and seven hundred animals—a terrible mortality, and one very much greater than obtained at Richmond.

So long ago as 1881 Galtier recorded some cases in which by the intravenous injection of the emulsified cord of a rabid animal he conferred immunity upon sheep and dogs. More recently Nocard and Roux * have confirmed Galtier's results, and have shown that it is possible, by a single injection of a fairly large quantity of a thick emulsion of "rabic" medulla, to render sheep and cattle immune. It would be useful, not to say interesting, to determine whether by following this method some portion at least of what remains of the herd at Ickworth could be saved. But up to the present I have not been able to obtain Lord Bristol's permission to attempt anything of this nature.

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The cut upon the finger which I gave myself while making the *post-mortem* examination on August 8th was allowed to bleed freely, and then washed well for some minutes with carbolic acid solution (1 in 20). It healed slowly, but without any suppuration, and I was disposed to think very little about it, especially so long as there was uncertainty as to the diagnosis of the disease. There have been fairly numerous cases in which practitioners have wounded themselves in the course of necropsies upon those dead from Rabies, and, almost without exception, no ill results have ensued. Here, for some time after the wound had been inflicted, there remained considerable doubt as to the nature of the disease. When, finally, the diagnosis of Rabies seemed perfectly certain, medical friends insisted strongly upon the fact that the knife by which I had cut myself had been used previously to dissect the brain and spinal cord of a rabid animal. Hence, seventeen days after the event, as the result of earnest solicitations from Professor Roy and others, I found myself beginning the treatment at the Pasteur Institute. From M. Pasteur, Dr. Roux, and every member of the staff I received the greatest kindness, and I was freely permitted to examine into every detail of the method. Dr. Ruffer's address to the Association at Leeds was so full and convincing that little is left to be said with regard to M. Pasteur's method. I cannot refrain, however, from recording my testimony to the extreme care that is taken to ensure accuracy in the treatment and security to the patients from any untoward results, and my admiration for the wonderful precision that regulates each step in the preparation and inoculation of the virus. For the benefit of those who in the course of their practice are called upon to deal with cases of bites from animals supposed to be rabid, it is perhaps wise to emphasise the fact that, as Dr.

* *Annales de l'Institut Pasteur*, 1888, p. 341.

Roux has shown, the freshly removed brain and cord of rabid animals may be preserved for long periods, without loss of virulence, in pure neutral, or rather non-acid, glycerine; and that sending specimens so preserved to the Pasteur Institute, it can there with certainty be determined whether a given animal was or was not rabid.

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In concluding these notes it may be as well to mention a train of symptoms of a somewhat ambiguous nature experienced by me. I do this with no little diffidence, yet so few cases of like nature have been placed on record that I feel it wise not to pass the matter by unnoticed. Within a day or two after the cut I became aware of a sensation in the forearm of the injured extremity, by no means acute enough to be termed a pain, but rather akin to the feeling one obtains in a limb after excessive muscular exercise. In time the same sensation made itself evident along the inner side of the arm. Considering this due to the irritation of some small nerve at the seat of the wound, I paid very little attention to it. It persisted, however, for some weeks, in fact throughout the period of treatment at Paris. From about the twenty-sixth day I woke regularly in the early morning, to find the limb in a state of "pins and needles." The condition lasted for several minutes; then disappearing, it permitted me to fall asleep again. Rarely was one of the other extremities affected, and it was only after the phenomenon had occurred without fail for more than a week that I called to mind that it might be allied to the "tinglings" described as a premonitory symptom of Rabies. From September 5th onwards—I had wounded myself on August 8th—I began to suffer from insomnia, not falling off to sleep until between 1 and 4 a.m., and from now I became more and more depressed. The depression was completely in spite of myself. I had no reason to doubt the efficacy of the treatment that I was undergoing, and looked upon it, not as necessary, but as precautionary, and as, on the whole, a pleasant experience. From September 8th this depression was constant; the dull heavy sensation in my arm became more marked, and soon I experienced great distaste for being alone for any length of time. On the 10th, while making my homeward journey, a tightening or constant slight constriction of the throat made itself felt. These symptoms became more and more strongly marked until the 14th, when for one short moment I found I could not swallow the saliva. That night, however, I fell asleep fairly soon; the next morning the depression had passed away, and although during the next few days I at times experienced some slight tightness of the throat, and awoke on some mornings to find my arm in the state of "pins and needles," I very soon felt myself in a state of good health, the last symptom to disappear being the heavy sensation in the arm. Taken altogether, the symptoms were at the worst not very prominent; they were, however, most decidedly uncomfortable.

What is the interpretation of these symptoms? On the whole I am inclined to believe them of nervous origin, pseudo-hydrophobic. In favour of this view it may be pointed out that certain signs of Rabies which are generally well marked, such as for instance pain at the seat of the wound, were characteristically absent; other signs, for example, the tingling in the extremities, were incomplete in their manifestations, and though present, might be otherwise explained. But, on the other hand, not a little can be said against the purely nervous theory. I am of robust health, sound constitution, and in temperament should describe myself as the very reverse of nervous. My belief in the efficacy of the Pasteur treatment is and was throughout complete. I knew at the time that, having been inoculated, the chances were even more than ninety-nine to one that I should not be attacked. So slight did I consider my danger that on August 22nd, but for the urgent entreaties of Professor Roy, I should have started for the Broads, instead of for Paris; and I fully

acquiesced with the authorities at the Pasteur Institute, when upon the thirteenth day of treatment they informed me that they considered my case such that they did not think it necessary to keep me for the usual fifteen days of treatment.

If indeed I passed through a most mild abortive attack of Rabies, then certainly that attack was due to the cut I gave myself, and not to the treatment I underwent. The time of the first appearance of the symptoms, namely, about the twenty-sixth day after the cut, would show this. The pain, if pain it may be called, in the injured extremity only, while the region of inoculation was completely painless, would evidence the same, while the fact that it was not until the seventeenth day after the infliction of the injury that I presented myself at the Rue Dutot would again add to the probability that symptoms should manifest themselves in spite of the treatment. It is impossible to avoid the feeling that, had I not gone to Paris, the symptoms, if only nervous in origin, would, in the want of that sense of security gained by undergoing the treatment, have developed themselves to a most painful extent; if of the nature of Rabies, would, failing the treatment, have become lethal; and that I owe to M. Pasteur and those at the Rue Dutot my heartiest thanks, not only for the courteous way in which I was received and treated, but perchance also for the continuance of my days.

PRELIMINARY REPORT OF THE BOARD APPOINTED TO MAKE FULL INQUIRY INTO THE ORIGIN AND NATURE OF A PREVALENT DISEASE AFFECTING STOCK, COMMONLY KNOWN AS "MANGE," IN QUEENSLAND.

(*Continued from page* 283.)

Taking these in the order mentioned may be considered—(1st) *bichloride of mercury* or *corrosive sublimate.* This, though a poisonous body which should not be brought immediately into contact with skin abrasions, is very powerful as a "germ" destroyer, a 1 in 1,000 solution being as effective in a few minutes as is a 5 per cent. solution of carbolic acid in forty-eight hours (Koch). A very strong lotion may be made by dissolving in 2½ pints of water 1 oz. of corrosive sublimate, 2 oz. of sal ammoniac, and 4 oz. of nitre; but this should be diluted, when used, with not less than three times its bulk of water. A non-irritant preparation of this chemical is an albuminate of corrosive sublimate, made by dissolving one part of this salt in 100 of the blood serum of the horse (procured by removal of the clot from drawn blood) or in egg albumen. The substance thus procured may be advantageously applied to abraded and inflamed surfaces. In this connection it may be worth while to suggest experiment with the use of very mild nitrate of mercury or citrine ointment.

Iodine, the ointment according to the formula already adopted by veterinarians, and containing iodine, iodide of potassum, or a lotion in which the same substances occur. Iodine, however, is most conveniently applied when dissolved in oil; and the following method, available when cod-liver oil is used, might be attempted in the case of other oils also:—Triturate the iodine with half its weight of iodide of potassium, and add gradually the oil, so as to form a uniform mixture. After standing a few hours, all the potassium iodide will be found at the bottom of the flask, leaving the iodine in perfect solution (Eymael).

Boracic Acid.—Borax (*sodic diborate*) combined with glycerine in the proportions of 2 parts of borax to 9 of glycerine, a 100 to 200 grains to the pint solution in hot water, or an ointment made with 8 ounces of borax to the pound of the menstruum—preferably commercial vaseline. Preparations of

borax, too, will relieve the itching—a prominent symptom of the disease—and may be applied also advantageously to broken surfaces.

Sulphur Acids.—Preparations containing sulphuret or sulphide of potassium (formed on fusing a mixture of 1 part by weight of sulphur and 2 parts of carbonate of potash), such as the ointment made by rubbing up (1) 1 oz. of this substance, finely divided and dry, with 6 lbs. of lard or vaseline; or (2) 5 oz. sulphuret of potassium, 2 lbs. soft soap, 2 lbs. lard, and 12 oz. olive oil (Gishurst's compound may be substituted for this ointment); or (3) the following lotion, known as Barlow's, containing sulphuret of potassium 1 oz., sliced soap ½ oz., limewater 15 fluid ounces, and proof spirit 4 fluid ounces; or (4) simply a solution of this salt in water, of strength 1 oz. to 1 quart. This last solution must be kept well corked up. Sulphide of sodium as an ointment made by mixing 3 oz. of this substance with 1 lb. of lard or vaseline. Hypo-sulphite of soda, with glycerine and water. A weak solution of sulphate of copper or blue vitriol, even so attenuated as 1 part in 1,000 of water; and sulphur itself, which owes its potency to the evolution of sulphurous acid, in the form of an ointment containing 1 part by weight of sulphur to 2 parts of the menstruum. The use of all external applications containing sulphur are likely to be more efficacious if this body is also administered internally.

Among agents grouped as belonging to the carbon series may be mentioned (1) carbolic acid (phenol or hydrate of phenyl), with glycerine—about 2 oz. of the former to 1 pint of the latter, or, stronger still, 5 oz. of the former to the same quantity of the latter; or preferably in the form of aceto-carbolic solution, made by mixing 5 parts of pure carbolic acid with 20 parts of acetic acid (vinegar in larger proportion where this is most accessible), and then adding 75 parts of water, or it may be used mixed with oil; (2) creasote, with which (*a*) an ointment may be prepared containing not more than 1 drachm to 2 oz. of the menstruum employed, or (*b*) a lotion made in a similar manner to the aceto-carbolic solution, creasote being substituted for carbolic acid; or by mixing 2 oz. of creosote and 3 oz. of liquor potassæ with 4 pints of water. Salicylic Acid: A solution of 4 grains of this substance in 2 pints of spirits of wine, or of salicylate of soda in water. Tobacco: Two or more preparations of this substance are available—(1) made by gently boiling 1 lb. of bruised fresh tobacco leaves in 12 lbs. of lard or other fat until the leaves are crisp, when they may be strained off; (2) by digesting for some hours 1 part of tobacco leaves bruised and 8 parts of olive oil. The latter preparation is sometimes known as oil of tobacco.*

To allay the Irritation.—In the first instance care should be taken that additional irritation is not occasioned by the employment of caustic remedies. Its relief, and so the prevention of the secondary results, of the disease, is brought about by the action of some of the above parasiticidal bodies, especially that of the borax preparations, or may perhaps be effected by the use of a cyanide of potassium solution (one ounce to the gallon). It must be remembered, however, that this last chemical is a violent poison, and should not be applied where the skin has previously been wounded, and perhaps, also, its application to large surfaces would produce deleterious effects. Solutions of alkaline carbonates (those of soda or potash) of the same strength in the case of each may also be advantageously employed. But the fact must not be overlooked, especially in so much as the epidermis is not innervated, that this irritation arises from the presence of dead or dying matter in contact with a sensitive skin, and that the itching, therefore, will be diminished if

* The use of such bodies as tallow, fish oil, tar, petroleum, or kerosine oil (especially in the form of an emulsion) and also of patent substances generally, especially when in the composition of such bodies there are active principles identical with or related to those above suggested for adoption, will naturally occur to the thoughtful reader.

steps are taken to assist nature in the natural process of eliminating this. Oiling the affected surface and washing with soft soap, or with a solution containing 1 oz. of carbonate of potash to the pint of water and diluted, when required for use, with an equal quantity of water, will accomplish much in this direction.

General Treatment.—Investigations have not proceeded far enough to allow of its being pronounced whether any constitutional treatment should be adopted, much less what is the nature of the requirements in this direction.

Treatment of Secondary Conditions.—The skin abrasions, inflammatory or otherwise, and loss of condition, are to be dealt with obviously in the ordinary way.

Cattle.

The disease in cattle affects very much the same parts of the body as it does in horses, and its presence may be recognised even at some distance by the peculiar erectness of the hair over the shoulder, rump, and especially on the root of the tail. Any difference in its general character when this class of stock is affected by it, is of a minor description, and dependent on the fact that the hide as well as the hairy covering of cattle differ from what represent them in horses. The secondary effects of the disease are also similar to those in horses, but, owing no doubt to the toughness of their skins, are less pronounced, and although the hair is shed in plenty and much scurfiness is produced these features are less noticeable than in the case of either horses or sheep. Careful examination of affected skin, skin detritus and hair derived from the living animal, has led me to the discovery of the same vegetable parasite in their case as in the other classes of stock, and permits me to pronounce that the disease is identical in them all. Any treatment given to affected cattle must perforce be suggested by what is applicable to horses, and although no doubt they will usually be left to the influence of the *vis medicatrix naturæ* (to shift for themselves)—the fact must not be overlooked that whilst these cattle carry the disease they are constant sources of infection for other classes of stock. It will sometimes happen, however, especially when working bullocks are concerned, that curative remedies will be sedulously applied. It has been previously remarked that the carcases of these animals are in no way affected by this superficial skin disease, and the statement is only repeated here to give proper emphasis to the fact.

Sheep.

Symptoms and Morbid Anatomy.—When the disease occurs in sheep no symptoms manifest themselves until the portion of the body-surface involved is injured to its full extent, and patches of wool are shed, leaving at first a pinkish glistening surface, which soon becomes covered over with a scab formed by exuded serous fluid, under which healthy wool-bearing cuticle is developed. The patches of various dimensions occur at different parts on both sides of the sheep affected, and as long as the disease lasts there may be a continuous development of fresh ones, or, by peripheral extension and gradual invasion of previously unaffected surface, an enlargement of those already formed. Owing to the dense manner in which the individual fibres of wool arise from the skin, and also to the fact that their deeply planted roots have a curvilinear direction, individual fibres or fragments of scarf-like cuticle cannot be shed, as in the case of the horse and ox. It therefore happens that the whole of the tissue affected comes off bodily together.

In handling a sheep and opening the wool, spots of a light yellowish-brown colour occupying the base of the fibres is the earliest symptom of the presence of the disease observable. These spots next extend their area, and then the wool commences bit by bit to be shed in small locks. It comes out

to the full depth of the roots, and is held together inferiorly in compact little portions well circumscribed at their original bases of attachment, which are elongated, measuring $\frac{1}{2} \times \frac{1}{4}$ inch or more in diameter, or rounded. These little locks are agglutinated by a moist opaque material, occupying a depth in the wool of about one-tenth of an inch, white below and yellow-brown above; this gives rise to the brown spots previously noticed. This material is found on examination to be almost entirely composed of epithelial cells with a little exuded matter, and both these as well as the wool fibres, especially at their base, which are often denuded of part of their cuticular sheath and thickened, contain large numbers of the same minute fungus sporules so characteristic of the disease in horses,* and which when they are found in this situation are easily isolated.

Beneath the discarded wool, even at so early a stage as when this has to be removed by the hand, the true skin is already developing a new cuticle. Sections of this tissue viewed under the microscope are exceedingly interesting, exhibiting as they do the new cuticle with a few fibres of wool in a very early stage of development.

It must be borne in mind that the scabs are purely secondary productions and are not ominous of evil, and that beneath them a new crop of wool is arising which will shortly push them off.

Subjects for further Inquiry.

I. Whether any particular condition of vitality in the affected animal is favourable to the development of the pathogenic operation of the parasite; and if such a condition exists, what then is the nature of this condition, on what does it depend, and how can its presence be done away with.

II. If no such condition can be found, are there other conditions favourable which do not discover themselves by producing a changed vitality, afforded by—(*a*) the state of the weather during any period of time; (*b*) a peculiar character in the soil dependent on its physical or chemical state; (*c*) a change in the constitution or nature of the fodder dependent on the influence of circumstances *a* and *b* acting singly, successively, or in concert.

III. Can any light be thrown on the origination of the disease in the Colony.

IV. What is the life history of the parasite considered apart from its relation to the animal in which it occasions disease, and the action of bodies or conditions on its destruction, or the retardation of its development; is it naturally brought under the influence of these. Solution of these questions would throw light (1) on its method of producing disease; (2) the duration of its inert stage after brought in contact with a body capable of taking the disease, and (3) the precise nature of curative and preventative remedies.

V. The limit to which this disease in stock is contagious, and whether it can be conveyed to human beings, and *vice versa*.†

VI. Prognosis of the disease.

HENRY TRYON.

Brisbane, *22nd March*, 1887.

Note.—Since the foregoing Report has been in the hands of the Minister, the *Sydney Mail* of 24th March, 1888, has come to hand. This paper contains a report made by the Government Veterinarian of N.S. Wales, to the Secretary of Mines of that colony, on the result of an inquiry into the same disease

* These must not be mistaken for the few cocci of Streptococcus pyogenes which occur in the little purulent matter which is sometimes present.

† Medical testimony on this point is forthcoming, but facts bearing on the question have not yet been brought directly under the notice of the writer.

in stock conducted during a visit to the Brisbane district, this officer having been deputed to proceed to Queensland for the purpose of investigating it. The memoir referred to comes too lately to hand to meet with criticism here; and, moreover, some of Mr. Stanley's propositions have been already met in the thesis now submitted. Here only it seems pertinent to remark,—why designate, as this investigator suggests, the disease *Prurigo*, and so give to it the name of a well-known disease in stock not due to such a cause as that to which he attributes this one? Why not describe it as an epidemic form of Confluent Ringworm?—H. T.

[This appears to be a very serious outbreak of cutaneous disease which, from the description given in this report, we are inclined to regard as Scabies rather than Ringworm. It certainly corresponds in its salient features to wide-spread invasions of Scabies we have witnessed among horses, especially in the Crimea. If proper search is made for it, the animal parasite (sarcopt or psoropt) should be found. In such a country as Queensland, treatment must be difficult and expensive. Common oil, Stockholm tar, and sulphur, in certain proportions, form an effective and cheap dressing, whether the disease be Ringworm or Scabies; but it must be thoroughly applied, and other sanitary measures should be carefully enforced.—ED. *V. J.*]

DEATH OF A MEDICAL PROFESSOR FROM GLANDERS.

A MELANCHOLY death from Glanders occurred recently in Vienna. Dr. Hofmann von Wellenhof, assistant to Dr. Gruber in the Institute of Hygiene, and who was only twenty-six years of age, had under his care a groom who had become infected with Glanders from one of his horses, according to one account. Another is that, at the end of September he was engaged in some experiments on Glanders, for which the material was furnished to him by Dr. Kowalski, a military surgeon, who devotes much time to bacteriological and hygienic investigations. Dr. von Hofmann's object was to ascertain whether the cultivated bacilli of Glanders were virulent, a point as to which he felt some doubt. About October 8th he fell ill with fever and pains on the left side of the chest. Physical examination detected pleuritic crepitant *rales*. After a slight apparent improvement, rheumatic symptoms supervened on October 13th. About the same time Dr. von Hofmann gave himself two injections of morphine, using a sterilised syringe belonging to the Hygienic Institute. Fever and general prostration increased daily, and in eight days more erythema-like knobs appeared on the skin; these, after a few hours, developed into purulent vesicles and abscesses. When taken into the General Hospital, on October 22nd, Dr. von Hofmann presented the symptoms of Glanders. He died on the following day, and the *post-mortem* examination confirmed the diagnosis. It also showed that the supposition of an infection through the hypodermic syringe was quite erroneous. This supposition was, immediately after the necropsy, publicly contradicted by Professor Kundrat, the director of the Anatomo-Pathological Institute, who examined the body. The following are the conditions which were found: innumerable metastatic nodules and abscesses of Glanders in the skin, the muscles, etc., etc.; the subcutaneous cellular tissue, however, even that around the sites of injection, was quite free from infiltration. There were, however, several infiltrations in the larynx, the trachea, and the left main bronchus. The cellular tissue of the posterior mediastinum was pervaded with partly yellow, partly purulent infiltrations, of the size of two centimétres. The infiltrations under the left pleura and along the ribs and the lymphatic vessels in that situation extended outside the chest; in connection with this

the deep muscles of the back were infiltrated with pus. On the left side, there was severe hæmorrhagic pleurisy; as also on the right to a lesser degree. The spread of the infiltrations was in favour of an infection through the air passages, particularly the trachea. The question as to how the infective substance arrived there was hardly possible to be answered.

A HUMANE AND ECONOMICAL CURRY-COMB.

SPRATT'S Company, Limited, of London, has just patented and brought out a new curry-comb, which deserves the notice and recommendation of the veterinary profession, because of its great advantages over the ordinary instrument, the defects in which are known to every horseman. Curry-combs are necessary in countries in which horses, for climatic reasons, have long coats at certain seasons, in order to free the skin from epithelial *débris* and dirt; but heavy-handed and unmerciful grooms only too often render it an instrument of torture when applying the rigid tool with which we are familiar, to the epidermis of very sensitive horses. The new comb should

protect such animals from this torture. Being a coiled steel-spring, it combines with the strength of metal all the elasticity of a brush, and fits into every hollow of the horse's body, thus doing away with the rasping of the ordinary curry-comb. It is cleaner in use, as dirt, etc., cannot collect in it, and horses can be groomed much quicker. It has also the advantage of being cheap, while it is made in two qualities, nickel-plated and japanned. As a hygienic and effective stable implement, it should quickly supersede the present tormenting and unsatisfactory curry-comb.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF COUNCIL, HELD OCTOBER 22ND, 1889.

Professor J. WORTLEY AXE, President, in the chair.

Present: General Sir Frederick Fitzwygram; Dr. Fleming; Messrs. J. Roalfe Cox, W. F. Mulvey, H. R. Perrins, William Wilson, George Thatcher (Solicitor), and A. W. Hill (Secretary).

The SECRETARY read the notice convening the meeting.

On the motion of Mr. WILSON, seconded by Dr. FLEMING, the minutes of previous meeting were taken as read and confirmed.

The SECRETARY said he had received letters from the following gentlemen regretting their inability to attend the meeting:—Professor Walley; Messrs. Briggs, Kidd, Lambert, and Taylor.

The PRESIDENT stated that a special meeting of the Council had been convened for the purpose of confirming the following resolutions, which were

passed at the quarterly meeting on the 9th October, for altering the Regulations for the Examination of Veterinary Students in General Education as follows:—

1. "That Section 2 (page 61 of Register) be amended thus: by striking out the first sentence of the clause and substituting in lieu thereof, 'Students who do not produce one or other of the certificates referred to shall be examined by a Board of Examiners appointed by and under the direction and supervision of this College, to whom they shall report the result of the examination, which shall be uniform and applicable to the whole of the United Kingdom.'"

2. "That Sub-section 2 of Section 1 of the Regulations for the Examination of Veterinary Students in General Education shall be altered by inserting the word 'or' between the words 'first' and 'second' on the first line thereof, and by striking out the word 'third' on the second line thereof."

Mr. WILSON said he had great pleasure in moving that the resolutions be confirmed, for it was highly desirable that the educational test should be of an uniform character throughout the United Kingdom.

Dr. FLEMING seconded the motion.

General Sir FREDERICK FITZWYGRAM said that in some quarters there appeared to be a little uncertainty with regard to the examinations. He should like, therefore, to ask whether the students passed their Matriculation Examination before entering the schools, or only just before their first professional examination, which would be about a year after entry into the schools.

Mr. WILSON said that the College as a licensing body had no control over the schools. Its business was to see that gentlemen before presenting themselves for examination had passed such educational test as it deemed sufficient to admit them into the profession.

The PRESIDENT said that, so far as refers to the London school, students were not admitted to the College until they had passed their Preliminary Educational Examination; but he understood that this was not universally the case.

Mr. J. ROALFE COX agreed with Sir Frederick Fitzwygram that it would be advisable for the student to pass his educational test before entering upon his studies for the first professional examination.

Dr. FLEMING said that on a former occasion when the matter had been brought up it was felt that the Council could not exercise any power with regard to the admission of students to the schools.

General Sir FREDERICK FITZWYGRAM said that, admitting the College had no power, he thought the expression of the Council would go very far to putting a stop to the abuse.

The PRESIDENT observed that the Council might perhaps be able to exercise some moral control over the schools.

The motion for the confirmation of the resolutions was then put and carried.

A vote of thanks to the President was carried.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE Quarterly Meeting of the above Association was held at the Bell Hotel, Derby, on November 8th, under the presidency of Mr. E. Beddard, Wolverhampton.

The members present were:—Messrs. H. Blunt, W. H. Blunt, C. Barnes, J. Burchnall, W. S. Carless, R. H. Cartwright, J. Coe, H. Collett, F. C. Golden, O. J. Hills, E. Hodgkinson, F. B. Jones, D. Fairbank, J. Malcolm, T. H.

Merrick, H. Olver, H. L. Pemberton, J. Kenyon, G. Rossell, G. Smith, A. Simpkins, R. C. Trigger, G. Wartnaby, J. Wolstenholme, J. Wiggins, and Capt. Russell.

After the minutes of the last meeting had been read and signed, the CHAIRMAN mentioned that several telegrams apologising for non-attendance had been received by the Secretary, but one called more particularly for notice. It was from Professor Williams, stating that he had mistaken the day of the meeting. He felt sure they would all regret Professor Williams' absence, which would be a great disappointment to many of them.

The SECRETARY announced also that telegrams and letters of apology had in addition been received from:—Sir H. Simpson, Professor Walley, Messrs Kidd, Greaves, Faulkner, Leather, Briggs, Green, Parker, Carless, Blakeway, Merrick, Perrins, Freer, and Locke.

Election of New Members.

On the motion of Mr. COE, seconded by Mr. BARNES, Mr. James Henry Turner Kenyon, of Derby, was unanimously elected.

The SECRETARY moved and the CHAIRMAN seconded the election of Mr. Gould, of Redditch, which was agreed to.

Mr. OLVER proposed the election of Mr. A. Simpkin, of Market Harborough, Mr. MERRICK seconded, and the proposition was carried unanimously.

Mr. OLVER also proposed, and the SECRETARY seconded, that Mr. Watkins, of Lichfield, be made a member of the Association, and it was carried unanimously.

The SECRETARY here mentioned that the Association had never been so prosperous as regarded numbers as at the present day.

The New Rules.

The next business on the agenda was to receive the Report of the Committee appointed to revise the rules.

Capt. RUSSELL moved an alteration in Rule 10 as amended. He suggested that the meetings should commence at half-past one instead of two, and continue till four o'clock instead of five. Mr. COE seconded the motion. After hearing the opinions of several gentlemen on the subject, the Chairman put Capt. Russell's motion to the meeting, when it was negatived by fourteen votes to three. The revised rules were then submitted to the meeting *en bloc*, and carried unanimously.

The CHAIRMAN then called upon the Secretary to read the Report of the Committee appointed to examine the roarers operated upon by Professor Axe at Wolverhampton, on the 24th May last, which was as follows:—

Report of Committee appointed by the Midland Counties Veterinary Medical Association to examine and Report on three Horses operated on for Roaring, by the Intra-Laryngeal Operation, on May 24th, by Professor Axe.

The Committee met at Wolverhampton, September 20th, and proceeded to the Albrighton Hunt Kennels, where the three animals were kindly sent for their inspection. Owing to indisposition, Mr. A. Over, M.R.C.V.S., who was appointed on this Committee, was unable to be present, and his place was filled, at his request, by Mr. T. Chambers, M.R.C.V.S., of Dudley.

Report.

Your Committee beg to state that they carefully examined the three animals, which they had seen operated upon at Wolverhampton, on 24th day of May last, and report as follows:—

No. 1.—Brown Gelding, about eight years old, the property of the Masters of the Albrighton Hunt. This horse is still a very pronounced roarer, in

addition to which, since the operation, he suffers from a distressing cough. The cough is very frequent, in fact almost incessant, when either walking, trotting, or galloping. In addition to this there is a copious discharge from both nostrils. No alleviation whatever of the roaring has followed the operation.

No. 2.—Black Gelding, seven years old, still a very pronounced roarer. In this case also discharge from nostrils, which pours copiously when pulled up after a gallop, also same incessant cough as in previous case, and horse much distressed by his exertions in galloping.

No. 3.—Bay Mare, six years old, still a pronounced roarer. In this case also cough is present, and is frequent in all paces. Mare quite unequal to much physical exertion in galloping, and pulls up very distressed. Again we find copious discharge from nostrils, also when drinking, a large quantity of water is returned down the nostrils. This also occurs in horses Nos. 1 and 2.

Your Committee greatly regret to have to report that in none of these cases has any benefit followed as a result of the operation. On the contrary, you have untoward results in the frequent cough and the discharge from the nostrils. In the opinion of this Committee also the animals exhibit more distress under exertion than do roarers of about the same degree under ordinary circumstances.

Your Committee the more deeply regret to report these unsatisfactory results, because having seen the operations on these animals performed by the Professor, they can with great pleasure testify to the absolutely skilful manner in which they were carried out.

Your Committee beg to add that the thanks of this Association are due to the owners of the horses for the trouble they took in again placing them at our disposal, and sending them some miles for examination.

(Signed)
E. BEDDARD, M.R.C.V.S., Wolverhampton.
ROBT. C. TRIGGER, F.R.C.V.S., Newcastle, Staff.
R. H. CARTWRIGHT, M.R.C.V.S., Wolverhampton.
T. CHAMBERS, M.R.C.V.S., Dudley.
F. B. JONES, M.R.C.V.S., Leicester.

Mr. COE said he was present at the Albrighton Hunt Kennels when the horses in question were operated upon, and he was very much surprised to see that no benefit accrued from the operation.

The CHAIRMAN remarked that they were all disappointed at the result, which was as bad as it was possible to be. A few days ago he had a conversation with Mr. Boycott, the present owner of No. 3 mare, when the latter stated he intended to breed from her. He (the speaker) was very much surprised and disgusted to hear of him ever dreaming to breed from a roaring mare, but Mr. Boycott said that she was sound in her wind before she went to Ireland, eighteen months ago, and therefore he contended that her ailment could not be hereditary. He (the Chairman) thought the point worthy of discussion, as he for one should like to know the opinion of the meeting as to whether roaring was hereditary or not. He could only say that the mare had since last month somewhat improved, and the other day she was ridden by a man at their first meet.

Mr. CARTWRIGHT mentioned for the information of the meeting that the mare was bought as a four-year-old by Lord Wrottesley, and was hunted by him the following season. She afterwards went to Ireland, where she was taken ill with inflammation of the lungs, and came back a bad roarer.

Capt. RUSSELL observed that the report did not disappoint him in the least. He had previously stated that roaring and whistling were two different things.

In the case of roarers an operation upon the larynx was perfectly useless, but it might do a little good in the case of whistlers. He repeated that roaring and whistling were two separate and distinct effects, the one being produced from the larynx, the other being in the head. He had read that the Army declined to allow those operations to be performed.

The CHAIRMAN: I remember having read a similar statement, but I don't know whether it can be credited.

In answer to a question by Mr. Coe, Capt. RUSSELL said that in his opinion whistling was due to some paralysis of the larynx, but roaring, a distinctly separate effect, was caused by an affection of the velum palati.

Mr. MERRICK: Is it not often found that whistlers become roarers?

Capt. RUSSELL: Yes, undoubtedly.

Mr. MERRICK, proceeding, said he should not personally be disinclined to breed from the mare referred to, being of opinion that her ailment was not hereditary, having originated from inflammation of the lungs.

Mr. SMITH quoted an instance that had come under his knowledge. A mare—his own property—some six months ago caught cold, and inflammation of the lungs set in. She was bad for three weeks, and then she turned out to be the worst roarer he ever rode. He never rode her again till that very morning, when he galloped her over some bad country, and he could assure them that she was perfectly sound in her wind.

Capt. RUSSELL said his experience went to show that when a horse roared it was done with the expiration, whistling being due to the inspiration.

Mr. BLOUNT, senior, remarked that he had known cases of horses having sore throats, thereby affecting the mucous membrane, and they had turned roarers, but ultimately recovered. Had they suffered from paralysis of the larynx, they would have been roarers for ever.

Mr. JONES could not satisfy himself that roaring was hereditary. The celebrated thoroughbred Hereford, who was himself a roarer, got a wonderful lot of stock, and all the horses that had long necks were roarers, but the short-necked ones were not. Had roaring been hereditary, why should not the short-necked horses also have proved roarers? As regarded a horse recovering from roaring, he quite agreed with Mr. Blount that the mucous membrane was affected by strangles and sore throat, and a horse might be a roarer for several months and then recover, but if paralysis of a recurrent nerve set in, he could never get sound in his wind. In reply to a question, Mr. Jones said it was his opinion that whistling was produced when the horse was first taken with paralysis, and as the paralysis progressed, several structures, such as the aryteno-epiglottic folds and the velum palati, fell in, and that produced roaring. He remembered a case in which a cart mare became a marked roarer. She got better of it, but in about two years afterwards roaring came on worse than ever. All efforts to give relief proved futile, and they had to decide the question with a pole-axe. But he had a look at the larynx, and found it diseased, and it must have been so a long period, and that appeared to have gradually affected the mucous membrane.

The CHAIRMAN: And do you think she would have been safe to breed from?

Mr. JONES: Yes.

Mr. MERRICK drew attention to the fact that Prince Charlie, a bad roarer, was sent to America for stud purposes, and at first the Americans made a great outcry at the importation of roaring horses. He was now dead, and they regretted his death as much as they did the death of Lyddington, for his stock was sounder than that of any horse for many years. That being so, he concluded that it should be no more difficult to breed from dams than from sires that were roarers.

Mr. JONES related another interesting circumstance in dissecting the larynx

whilst living, in which he sought to disprove Capt. Russell's theory that roaring was done with the expiration and whistling with inspiration. The fact that they differed at all, he said, showed very clearly that they did not all know the physiology of the larynx.

Mr. BARNES observed that last month he examined two roarers—one a confirmed roarer. The latter, however, worked wonderfully well, but they were constantly afraid that it would be suffocatad. He should like to ask if any of them knew of roarers going for a long time without fatal results.

Mr. SMITH said he could mention a case in answer to Mr. Barnes. It was a horse he drove himself, and although it turned roarer it was a good worker, and could do fifteen miles an hour. He would do five or six miles at his top speed, and then if you didn't pull up he would squeal, and you would be in danger of a smash. He quite lost his head.

A VOICE: He lost his wind, I should think. (Laughter.)

The CHAIRMAN, reverting to the report, said that one of the roarers—number one—they had to destroy. One of the whips rode him and he was absolutely useless. Scott, the huntsman, sent the larynx to him, and he had a look at it, and suggested that it should be sent to Professor Axe, that he could judge whether or not they had truly and faithfully reported the case. They could, doubtless, get the larynx of the second horse for personal observation, if they desired it, for the animal was not worth much money.

The SECRETARY suggested that the Association should purchase the black horse and have the larynx dissected during the next meeting. It might even be killed just before the meeting and the larynx dissected in the room. They had sufficient funds for the purpose.

The CHAIRMAN.—I could get the horse.

This course having been resolved upon, the discussion was resumed.

Mr. OLVER said that some time ago he had brought to him one of the worst roarers he ever heard, and Captain Russell could bear him out in that statement. It lived two or three years after the time he spoke of, and on its death he made a *post-mortem* examination. They had previously had all sorts of theories as to what had caused the Roaring, but they all proved wrong. The larynx was perfectly healthy, but the lungs were in a condition he hardly knew how to describe. They had simply collapsed, and there were no air-cells. He knew the animal never had Pneumonia, but from some reason he could not explain, the air-cells had become gradually obliterated.

Mr. COE mentioned a singular case of Roaring. A horse had been out with the Queen's staghounds. The stag was captured and put into a loose box at a neighbouring hostelry. A valuable hunter was put in the same stable, and although it was previously sound, the next morning it was a Roarer. It was stated that the Roaring was caused by fright.

The CHAIRMAN remarked that if they were to talk till Doomsday, they would never agree as to the exact cause of Roaring.

Mr. TRIGGER, the Vice-Chairman, said he would like to make a few remarks upon the subject, having been present when the operation was performed. He thought the result failed to give any relief to the animals. It did seem that there was some slight evidence that one mare was able to undergo more exertion than when she was first seen, but he recollected noticing that the mare had severely blistered sides. He himself did not think that in her case the disease was located in the larynx at all. If she could undergo exertion at the present time, it was, he said, simply because she was in better health—it was not a result of the operation. She was, like the other horses operated upon, subject to coughing, therefore it was plain that she derived no benefit from the operation, but participated in its ill-results. The question he asked was, why did the operation fail to give any relief? Because, he said, they never attacked the seat of the disease at

all. They removed the paralysed structure—paralysed as the result of the disease—they failed to remove the cause of that paralysis. They got several untoward results, such as coughing and affection of the mucous membrane. They got a certain amount of irritation, but although they removed that obstacle they had never touched the seat of the disease, and therefore the animal was as bad a Roarer as ever, and its general condition was worse, inasmuch as they got several undesirable results from the operation. He did not agree with Captain Russell when he said that Roaring was made in expiration. His opinion was the exact opposite. With regard to Prince Charlie's stock not being Roarers, he pointed out that he had gone to a climate where Roaring was almost unknown. Prince Charlie was not an isolated case, for Roaring was unknown in drier climates. Referring to a question asked by Mr. Barnes, he (the speaker) thought there was no doubt that Roarers were very often serviceable horses, when worked slowly. Speaking on the report itself, he could only say that it was the unanimous opinion of the five surgeons constituting the Committee, and he could only regret that it was not more satisfactory.

The report was then submitted to the meeting, and unanimously adopted, and on the motion of Mr. Olver, a vote of thanks was accorded to those gentlemen forming the Committee, for the services they had rendered.

Tuberculosis and the Contagious Diseases (Animals) Act.

Mr. TRIGGER said that more than a year ago, a resolution was passed by their Association to the effect that the time had arrived when Tuberculosis should be included in the Contagious Diseases (Animals) Act, and that the inspection of abattoirs and dairies at present so imperfectly conducted in this country should be improved and transferred from police officers to qualified professional men. Unfortunately, on that occasion, the resolution was not brought under the notice of the proper authorities. He would, therefore, move that the resolution he had stated should be forwarded to the Council of the Royal College of Veterinary Surgeons, the Local Government Board, and the Chamber of Agriculture.

Mr. WIGGINS seconded the resolution.

Mr. MERRICK pointed out the difficulty that would be incurred in inspectors condemning beasts supposed to be suffering from Tuberculosis. It was hard to be absolutely certain in the matter. There was more danger to the human subject from the milk than from the flesh of such a beast. The Council in 1888 would not consent to bring it under the Act because they did not see their way to compensate slaughter, and he was afraid it would be difficult to persuade the authorities to bring it under the Act now.

Mr. OLVER remarked that he had always taken a great interest in the matter. He might say a word to a certain friend who seemed adverse to the opinion that Tuberculosis showed itself in pigs. He himself was rather surprised some eighteen months ago to learn that Tuberculosis was as common in swine as in cattle. He had taken the trouble to go round to pig killers, and he was surprised to find that a large number of the pigs slaughtered, to all appearances healthy, were more or less suffering from Tuberculosis. They all knew that it existed in horses, and they knew very well that it had been produced in animals from the human subject. He thought they were bound to pass that resolution, because it would be the means of stopping a number of wasters that were producing diseased milk for consumption by the people.

Mr. BLOUNT, Junior, said a case of Tuberculosis once came under his notice. A cow had Milk Fever and died. He made a *post-mortem* examination, and found she was suffering from Tuberculosis, the whole of her lungs being covered with tubercular matter. She seemed to be in a perfect state

of health, and had always done well. That fact would prove the difficulty to be experienced in determining whether an animal was suffering from Tuberculosis or not.

The resolution on being put to the meeting was carried unanimously.

A vote of thanks to the Chairman, proposed by Mr. Merrick and seconded by Mr. Smith, brought the meeting to a close.

The members subsequently dined together.

YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this society was held at the Queen's Hotel, Leeds, on the 8th November, the President, Mr. Lodge (Dewsbury), was in the chair, and the following veterinary surgeons were also present:—Messrs. A. W. Briggs, Halifax; Joseph S. Carter, Bradford; J. M. Axe, Doncaster; G. E. Bowman and A. W. Mason, Leeds; S. Chambers, Kirkheaton; Geo. W. Carter, Keighley; T. Fletcher, Sheffield; A. E. Hanson, Norwood Green; H. Snarry and George T. Pickering, York; M. Robinson, Barnsley; J. Clarkson, Garforth; J. Atcherley, Harrogate; J. E. Scriven, hon. treasurer, Tadcaster; and W. F. Greenhalgh, hon. secretary, Leeds.

Letters of apology for non-attendance were read from Messrs. Toope, Knaresborough; Bale, Otley; Deighton, Riccal; Cooper, Huddersfield; Danby, Driffield, and F. P. Carter, Bradford.

A Vote of Condolence.

Mr. J. S. CARTER moved a vote of condolence with the widow of the late Mr. E. C. Dray, of Wandsworth, Surrey, and who practised in Leeds for many years as a veterinary surgeon. He remarked that the deceased gentleman, in conjunction with Professor Williams, the late Jno. Cuthbert, and W. Broughton, of Leeds, and himself, inaugurated the society at whose quarterly meeting they had met that day. The deceased gentleman was one of whom that society might well be proud, as after leaving the immediate neighbourhood of Leeds, he still had the interests of the profession at heart, and had filled the office of President of the Royal College of Veterinary Surgeons, and for some years occupied the position of treasurer to that body. Mr. Dray attained the ripe age of eighty-three years, and he (Mr. Carter) saw him for the last time in April, when he complained about the state of his health, and feared he would not be able to meet many of his old friends again. He (Mr. Carter) had been acquainted with him for many years, and he had never known a more upright or genial member of the profession, or a gentleman who was more willing to give every assistance in his power to the younger members of the profession.

Mr. AXE, in seconding the motion, which was carried unanimously, paid a high tribute to the memory of the deceased.

On the minutes of the last meeting being submitted, Mr. BRIGGS said he would like to refer to the comments made by Professor Walley on the remarks he (Mr. Briggs) was reported in the journals to have made at their last meeting on the subject of Tuberculosis. What he (Mr. Briggs) had intended to say was, that badly drained and defectively ventilated mistals would, in his opinion, give rise to Tuberculosis, *when a predisposition existed.*

Mr. G. W. CARTER remarked that, in Professor Walley's criticism, remarks had been attributed to him (Mr. Carter) which were contrary to the reports which had appeared in the journals, and therefore it was unnecessary for him to reply.

The minutes were then confirmed, subject to the correction regarding Mr. Briggs' speech.

The HON. SECRETARY nominated as members of the Association, Mr. Jas.

Wooding, Shepley, and John Appleyard, Halifax, at the request of Mr. Cooper, Huddersfield.

Mr. T. B. Exley, Leeds, was elected a member of the Association, on the motion of the hon. sec., seconded by Mr. Carter.

The HON. SECRETARY stated that he had received a letter from Mr. W Awde, hon. sec. of the newly constituted South Durham and North Yorkshire Veterinary Medical Association, asking for a copy of the rules of the Yorkshire Veterinary Medical Association. The copies of their rules were exceedingly scarce; they had not been revised for many years, and he felt they would not be of much use to Mr. Awde, until the work of reconstruction was completed.

Fixed Meeting Dates.

The HON. SEC. read communications from Mr. H. Kidd, Hon. Sec. of the Royal Counties Veterinary Medical Association, asking the members of the Yorkshire Veterinary Medical Association to take into consideration the advisability of having fixed dates on which to hold the meetings of the various associations, owing to the meetings of different associations being held on the same day. He suggested that the Presidents and Hon. Secretaries of the various associations hold a conference to fix the various dates of meeting. He concluded as follows: "It is quite evident these associations are having a wonderful effect in raising the profession. It is my earnest desire that we should meet each other, and I have no doubt that the members of the various associations would also receive mutual benefit as the result of the conference."

Mr. FLETCHER thought it was a good suggestion to have fixed dates. There was a meeting of another association that day at Derby, which he certainly would have attended except for neglecting his own association.

Mr. J. CARTER proposed that in future the meetings of the association be held on the last Friday in the first month of every quarter.

Mr. FLETCHER, in seconding this, remarked that they would probably hear from the secretaries of the other associations as to whether the date they had chosen was agreeable to them.

Resolution carried.

Circulars to Local Authorities.

The Hon. Sec reported that the recommendations as drawn out by the association in reference to the appointment of empirics as meat inspectors, etc., had been forwarded to a large number of local authorities in Yorkshire, but he had not received many replies.

Mr. BRIGGS pointed out that the circular had been taken notice of at the various meetings. It was a question which was gradually coming to the front.

Mr. LODGE thought the circular had done good; in fact, perhaps as much good as anything they had done.

Case of Lymphangitis.

Mr. A. E. HANSON remarked that he would like to bring before the notice of the members a somewhat remarkable case which had occurred recently in his practice. On the 5th of October a mare was purchased at Wibsey fair, and worked for a time all right, but on the 25th of October he was called in to see her, and found her suffering from Lymphangitis in both hind legs, one leg being fixed to the ground, and the near hind leg was swollen from the stifle to the foot. She ate well, but was slightly feverish; the mouth hot, but the pulse normal. He administered a six-drachm dose of aloes, and gave her stimulants. For several days the near hind leg remained fixed and rigid, and on the Tuesday following he called in Mr. J. S. Carter, and they

examined her thoroughly, per rectum and otherwise, but could discover nothing to account for the symptoms. She continued in the same state until Friday, when she recovered the use of the near hind leg, and on Saturday could walk about. On Sunday he found that the off hind leg had become affected as the near hind had been, but her appetite continued good. On Tuesday night following she became affected in both hind legs, and fell to the ground. At eight o'clock at night, however, she jumped up, could walk about, and continued in a satisfactory state at the present time. In his opinion it was a case of embolism or partial paralysis, but he could not say which.

Mr. FLETCHER: How was the pulse?

Mr. HANSON: The pulse was normal, and her urine was not at all coffee-coloured; but within the last day or two it has become somewhat more coloured. I have applied extract of belladonna to her teeth, and it has seemed to be beneficial to her. I have applied hot fomentations, and rubbed the legs with embrocation. Both legs were swollen as in a case of Lymphangitis.

Mr. G. W. CARTER: Was there a line of demarcation between the swelling?

Mr. HANSON: No there was not; the swelling is there now, but not to as great an extent as it was last week.

Mr. G. W. CARTER thought it was an ordinary case of Lymphangitis, with pressure on the nerve supply. He had seen other cases almost on a par with Mr. Hanson's case.

Mr. HANSON: At first she seemed to be feverish, but after a good physicing she was quite cool again.

Mr. J. S. CARTER described his visit to the mare, and said he inquired if she had been down, but was informed she had not, and that she had been seized quite suddenly. Of course she might have been down, but there was nothing in the way of broken head-gear or anything of that sort to indicate it. He could find no lines of demarcation or anything analogous to it. He had had another case lately similar to this. There was great swelling on both hind legs and a discharge from the nose, but he could never detect any marks at all on the Schneiderian membrane or in the eye.

Mr. BRIGGS: Is there no alteration in the temperature?

Mr. CARTER: The legs felt hot.

Mr. HANSON: It looks strange that this animal after being affected in each hind leg in turn, should become paralysed in both.

Mr. BRIGGS: Has the swelling disappeared?

Mr. HANSON: The swelling is there still, but not to the same extent as formerly.

Mr. SNARRY: What started this case?

Mr. HANSON: Nothing, so far as I can learn. She was working on the Thursday, and on Friday she was in the state I have described.

Mr. SNARRY: I should think it must be by Lymphangitis causing nerve pressure from which the paralysis arose.

Mr. FLETCHER said he was of opinion that it was a case of embolism pressing upon the nerves which caused the paralysis, and why he thought so was because some seven or eight years ago he had a similar case, but only one hind leg was affected. On examining the rectum he could feel the embolism, and after some days it was removed and the animal became right again. The limb was fixed, but there was a certain amount of twitching. It was in slings about a week when it began to use the limb. The pulse was quick and full, and there was constitutional disturbance.

Mr. G. W. CARTER: Did it recur?

Mr. FLETCHER: No.

Mr. HANSON: I found the less the mare was exerted the better she was. There was less shivering in the member not affected. Both fore legs were unaffected.

A Calcareous Thymus Gland.

Mr. G. W. CARTER: I have a specimen to submit to this meeting. I have formulated a theory as to what it is from the position I took it from. I think it is a Calcareous Thymus Gland, and I took it from the mediastinum of a cart-horse, nine years old, that had fractured its suffraginis. Perhaps every two or three months, for the last eighteen months of his life, he was affected with a low bilious attack. I treated him with calomel and physic, and in about ten days he would be all right. I can't see any connection between a calcareous gland and an affection of the liver. I have found nothing like it in any published veterinary works, but I have shown it to various medical men, who tell me they have cases of calcareous glands in various parts of the body.

An Unusual Cause of Obstruction.

Mr. G. W. CARTER then proceeded to describe a very unusual cause of obstruction of the bowels in a mare, which resulted in the death of the animal. The subject was a brown carriage-mare, seven years old, which commenced being ill with what appeared to be an ordinary attack of colic. The usual remedies were administered, but the pain continued, though at no time was it very acute. Opening medicine was given, followed by doses of sedatives combined with linseed oil, and enemas were frequently exhibited. For five days the pain continued and no fæces were passed, the animal then dying from exhaustion. Upon making a *post-mortem* examination, the following condition of the intestines was found to exist. When the contents of the abdominal cavity were exposed to view, no structural alterations could be observed, neither were the various viscera altered in colour or position. There was no unusual amount of tympany of any of the bowels. Upon laying open the double colon throughout its entire length, the cause of the obstinate constipation was found to be a peculiar emphysematous condition of the bowel for about the last eighteen inches of its course, and immediately in front of the commencement of the floating colon, the inflated coat of the bowel being about six or seven inches in thickness, and thus completely blocking the passage and preventing any fæces from entering the single colon. Upon removing the affected portion it directly commenced to collapse until, upon the following day it was not more than two to three inches thick. The cellular tissue of the affected portion of the bowel presented the appearance of a number of bladders inflated with air, which upon being pricked with a pin immediately collapsed with a hissing noise caused by the escape of the contents. The mucous membrane covering the same portion of the colon was but very little heightened in colour, and presented upon its surface many of the same bladder-like cysts filled with air, but smaller in size than those of the cellular tissue. There was no other cause of obstruction to be found, and the contents of the bowels in front of the diseased portion were in a fluid condition. I should suggest that this abnormal condition might arise from an injury to the mucous membrane causing a wound by which the gases generated in the bowels might find an entrance into the cellular tissue.

Mr. FLETCHER said he had seen a good many affections of the bowels, but he had never seen one such as Mr. Carter had described, and he agreed it had probably arisen from the cause suggested by Mr. Carter.

Swine Fever.

Mr. FLETCHER asked if any of those present had read the communications in the journals referring to Swine Fever producing Fever in the human sub-

ject. He had been an Inspector for many years, but he had never seen anything of the sort.

Mr. G. W. CARTER thought the matter was worth very little notice, and Mr. AXE agreed with this.

An Interesting Point.

Mr. AXE: I should like to draw the attention of the members of this Association to what I consider to be an important and interesting case. Late in July or early in August last, a thoroughbred stallion colt, by Peppermint, belonging to Mr. Waterhouse, of Skellow, was being got ready for exhibition at the show of the Yorkshire Agricultural Society. The horse was being exercised by a man in a field, and being fresh he made a big jump, and began to bleed freely at the nostrils. The usual means for stopping the bleeding were used, and after the loss of a great quantity of blood, the flow was stopped. The result of the rupture was that the horse became completely blind in both eyes. I think this is an important thing in reference to the question of hereditary complaints. Where are we to draw the line? You surely would not call this an hereditary complaint. The horse himself has perfectly recovered, but he is as blind as a bat. The question is, how did the bleeding arise, and should such a horse, under such conditions, with no hereditary taint as to blindness, be debarred from taking one of the Queen's premiums?

Mr. BRIGGS: You do not think he struck anything?

Mr. AXE: No. I have no doubt the colt was living well and making blood fast. He gave a big jump, and a blood-vessel broke, and he bled like a pig.

Mr. G. W. CARTER: Have you any idea what vessel it was?

Mr. AXE: No.

Mr. SNARRY: I remember a case in which a colt was being broken in, and it reared and came back on its poll. It bled profusely down both nostrils until it nearly sank. The bleeding was stopped, but two days after it became totally blind in one eye, and was half blind in the other. My idea of that was that it was a partial fracture of the basilar process of the occipital bone.

Mr. AXE said the pupils of the eyes were bold and dilated.

Mr. BOWMAN: I should like to ask if it is the opinion that a horse suffering as has been described by Mr. Axe should be shown for a Queen's premium.

Mr. ATCHERLEY: I should say decidedly not.

Mr. BOWMAN: It is not proved that the disease is hereditary.

Mr. G. W. CARTER: That is the question.

Mr. AXE said he had traced the pedigree of the horse some way back and could find no trace of hereditary unsoundness of the eyes.

Mr. G. W. CARTER: You are taking it for granted it is the result of injury.

Mr. FLETCHER: I think after relating the case, Mr. Axe asked us if we considered the case one of unsoundness, in which the horse could not be used for stud purposes. I think there is very little doubt very few people would accept him as a sound horse, but the question is whether his stock would be affected. I should say it would not be.

The PRESIDENT: Do you think he is not fit for stud purposes?

Mr. FLETCHER: I should say he is fit, but perhaps he would not be accepted for the Queen's premium.

Mr. AXE: Well, Goggles, my own horse, was blind, but we never knew him to get a blind one.

The PRESIDENT: If the blindness is the result of an accident or injury I should not hesitate to put a valuable mare to the horse, but it must be proved that it resulted from an injury.

Mr. ATCHERLEY pointed out that it was impossible to prove to anyone blindness arose from injury.

Mr. G. W. CARTER: Can we convince ourselves? In this case described by Mr. Axe, I don't think that there is a shadow of a doubt that if the horse were put in for examination before the Royal Commission it would be rejected, and it would be impossible to prove that the blindness arose from accident, and therefore the Commission would be justified in rejecting him. What vessel could it be that would rupture and bleed down the nostrils, where no clot could interfere with the optic nerve?

Mr. ATCHERLEY mentioned a case in which a horse commenced bleeding from the nostrils, and he bled him in both jugular veins, and the bleeding stopped at once, and he was all right.

Mr. BOWMAN asked if the horse Mr. Axe had mentioned had been used at all.

Mr. AXE replied that the animal had covered several mares.

Financial.

The HON. TREASURER (Mr. Scriven) presented his annual financial statement, which showed the Society to be in a satisfactory condition, and it was unanimously adopted.

Mr. G. W. CARTER proposed that a statement be sent to all members of the association whose subscriptions were in arrear.

Mr. BOWMAN seconded this, and it was carried.

Election of Officers.

The HON. SECRETARY (Mr. Greenhalgh) explained that hitherto it had been the rule to elect the President by seniority of membership. The two gentlemen who came next on the list were Messrs. Hardy, of York, and R. L. Robertson, of Leeds. He had approached both these gentlemen on the matter, but they had declined to accept the office. Next in order of seniority came Mr. Briggs and Mr. Snarry. The latter gentleman, at present, could not see his way to fill the presidential chair, and therefore he proposed that Mr. Briggs be President of the Society for the ensuing year. He might say that Mr. Briggs had been a regular attendant at the meetings of the association and had taken a lively interest in the proceedings, and he believed he would add dignity to the chair and conduce to the advancement of their mutual benefit.

Mr. SNARRY seconded this, and it was carried unanimously.

Mr. BRIGGS briefly returned thanks.

Mr. Clarkson and Mr. Pickering were elected Vice-presidents in conjunction with the retiring President, the former on the motion of Mr. LODGE, seconded by Mr. SCRIVEN, and the latter on the proposition of Mr. AXE, seconded by Mr. BOWMAN.

On the motion of Mr. G. W. Carter, seconded by Mr. Axe, Mr. Scriven was re-elected hon. treasurer, and on the motion of the retiring president, seconded by Mr. Mason, Mr. Greenhalgh was re-elected hon. secretary.

Votes of Thanks.

Mr. BOWMAN proposed that the best thanks of the Association be given to Mr. Lodge for the very able manner in which he has discharged the duties of President during the past year. He said: It is with great pleasure I rise to propose this vote of thanks to our worthy retiring president. I am sure he has conducted our meetings in a most scientific and satisfactory manner, and that he has been most industrious and painstaking in promoting the advance of our profession. At these meetings he has fulfilled the promise made in his inaugural address that he would insist upon attention from members

present, and would not allow general conversation while a subject was being discussed, and, gentlemen, each and all of you will, I am sure, agree with me in giving him our hearty thanks.

Mr. AXE, in seconding this said Mr. Lodge had taken great interest in every debate, and whatever he had done he had done heartily and well.

Mr. FLETCHER said Mr. Lodge had kept them in order. He had prevented much of the desultory conversation which used to prevail, and which wasted such valuable time. He had discharged his duties thoroughly, and they ought to be very much obliged to him.

Mr. GRELNHALGH said he would like to bear testimony to the amount of hard work Mr. Lodge had gone through during his year of office. He could assure them he had had the interest of the Society very much at heart, and had been constantly planning and contriving to forward the welfare of the Association.

The vote of thanks having been put and carried with enthusiasm,

Mr. LODGE: I thank you heartily for the kind manner in which you have accorded a vote of thanks to me for any services I may have rendered to this Association. I have tried to do my best without fear or favour. If I have on any occasion been rather hard in calling any one to order, I hope I have given evidence that I have done it for the benefit of the Society. I believe during my year of office this Association has done good and valuable work, and that the members of the Association who have attended the meetings have derived benefit from the papers which have been read and the various discussions which have taken place. I shall always endeavour to support the authority of the chair, and shall continue to take as profound an interest in the affairs of the Association in the future as I have done in the past. In conclusion, I may say I have had great pleasure in working with the hon. treasurer and the hon. secretary, and the other officers.

Votes of thanks to the hon. secretary and hon. treasurer concluded the proceedings.

W. F. GREENHALGH, *Hon. Sec.*

ROYAL SCOTTISH VETERINARY SOCIETY.

(*Continued from page* 388)

On the invitation of the Chairman, Professor MCCALL, Glasgow, offered a few remarks. He said he was one of those who believed in inoculation, provided it was performed in a sound manner by use of genuine virus. He remembered in his college three years ago they had a cow, two yearling heifers, and one bull. These animals had never been in contact with any animals labouring under Pleuro-pneumonia, and they were sound. The cow was inoculated, and her tail was amputated after six weeks' cleavage. She was, while perfectly healthy, put into a byre where disease had been lodging, and remained in it for about nine months. During that time, though many animals had been removed, she was neither up nor down. The two heifers were inoculated, and it "took." Their tails were also docked. They remained together for over four months, and he sent them out in the following month to mix among the other stock on his farm. They, too, were neither up nor down. The bull never took the disease either. In his own mind he was not only satisfied that inoculation was a preventive, but he went further, and said that a perfectly sound animal after inoculation was not a source of contagion. Such had at least been his experience. If they wished to get rid of the disease completely, however, it could only be by slaughter, though they might reduce it into far narrower dimensions by adopting inoculation under certain conditions. Ten out of thirty animals in a byre would withstand the disease. Supposing they did inoculate them they

were always saving one-third of these animals, and that was of considerable value to the country. If they adopted inoculation immediately on detecting the disease in a byre they would thus have one-third, or possibly two-thirds of the animals remaining so healthy, and they would not know that they had contracted the disease. In that way a large sum of money might be saved. It was, however, hardly safe to operate in that way unless animals that were operated upon went direct from the premises to the slaughter-house. The man was not born who could tell in every case whether an animal had had Pleuro-pneumonia or not. If they could tell with certainty animals that had diseased lungs it would be all right. If animals, as hitherto practised, were allowed to be removed from the premises after apparently recovering, they would never get rid of the disease, even after inoculation, by any such methods. Inoculation appeared to be only an auxiliary measure, but if they wished to get rid of the disease they must ultimately rely upon slaughter.

Mr. CAMPBELL said Professor McCall had told them that he believed in inoculation if they had a guarantee that every animal was sound. He endorsed every word of that. They had been told not many months ago by one who had practised inoculation, that it was impossible for an animal to slip his observation when going round to examine a stock of cows, because he had a thermometer, and that whenever it registered a quarter of a degree over the normal temperature he at once concluded it must be an infected animal, which must be ordered out to be killed. To his great surprise a few days ago in the National Congress it was said that the thermometer was of no use at all. He had seen many cases of lung disease where the greater part of the lung was totally diseased, and still the normal temperature registered was 102°. This showed that in other diseases of an inflammatory nature there was ordinary fever. The animal might live possibly for a year after a severe attack of Pleuro-pneumonia when the fever had abated. He held that a lung or a portion of it never could perfectly recover, and that there was a serious and covered danger in inoculation.

Professor MCFADYEAN took it for granted they were all familiar with the fact that there were few questions that had been more disputed, the remedies of inoculation or slaughter for Pleuro-pneumonia. It would be a long time before that discussion terminated. He was strongly of opinion that the discussion would not be very much prolonged if facts were cited more than they were. That had been brought to his mind by the remarks of Bailie Cranston at the meeting held in the hall that day, in which he complained of a prospective increase of the rates, consequent upon the slaughter regulations. They all entertained a lively hope that slaughter was not to be a perpetual measure. The sum required to compensate for the slaughter for Pleuro-pneumonia in the large cities might be estimated in places where the system had been in force for six years. In France it had been in operation since 1882. There they slaughtered those animals that showed symptoms of the disease, and then inoculated all the others. The result was that the sum paid in compensation had risen steadily ever since. It amounted to £6,000 a year. This was a fair comparison ; it was obviously favourable to the method of slaughtering, as at present in force in this country. The French system held out absolutely no hope that they would ever have any less to pay than at present. Referring to the observations of Professor McCall, he said that every man who was informed on the subject, and who was not obstinate, would agree with what he had said. He was favourable to inoculation only when it was practised upon uncontaminated stocks, or only on condition that the animals in contact with the disease should only leave the byre for the purpose of slaughter. It was merely a system of disguised slaughter, but it was not what would be adopted

in this country. At the present time, Edinburgh and Glasgow had a small burden compared with Aberdeen and Ayrshire. It appeared to him that if they were to take upon themselves the responsibility of urging the local authorities to set aside the Slaughter Order, they would have to be prepared to explain how it was that, in other countries in Europe, until slaughtering had been carried out no hope had existed of their being able to deal with Pleuro-pneumonia, and also how it was that in countries in which the system of slaughter had been in force for four or five years, they had got quit of it. He instanced Norway and Sweden, Holland, Switzerland, Baden, Luxemburg, adding that not only had these countries got rid of Pleuro-pneumonia, but that in some of them it had been as rampant as it was in this country. This was a complete argument to those who with little foresight urged that stamping out the malady would not be profitable. For his part he thought if it was not done now, they would have to resort to it at no very distant day again. It was foolish and almost culpable on the part of the authorities to put in force any measure, without taking steps to ensure that it was properly carried out. He was not sure that such steps had been taken in this country. The rule in Holland was that when a district was declared infected, the Government immediately nominated a certain number of inspectors; they took a census of the whole stock in that district, and then they were able to account for the death or removal of any animal in that district until the outbreak was stifled. If we had such a system adopted in this country, and could ensure that animals which died from the disease were not put out of the way, and evasion practised, they would very shortly have the last case of Pleuro-pneumonia.

Mr. PENDER, Lockerbie, submitted what he termed a veterinary sanitary scheme for the prevention of contagious diseases in cattle. The measures he was about to propose had never yet been adopted, but he thought they were necessary to cope with contagious and hereditary diseases. His scheme had for its object that every animal should have pure water, pure air, wholesome food, and rational and humane treatment, and also that only healthy animals be used for breeding purposes. Further, in the event of an outbreak of disease, to enable the sanitary officials promptly to ascertain the fact and to take steps to overcome it.

He suggested, (*a*) the constitution of veterinary sanitary boards with compulsory powers; (*b*) that every owner brand all cattle belonging to him, with such marks as shall be directed, indicating the nation, county, parish, and owner, and to register the same in a stock book; (*c*) that in said stock book he register all births, pedigrees, diseases, and deaths, or the delivery of any animals out of his hands alive; (*d*) that owners ascertain the nature of any disease appearing in any animal, from a M.R.C.V.S., who shall enter particulars in the stock book, or of the death of the animal; (*e*) that owners provide sufficient supply of wholesome water, breathing space, ventilation, and other sanitary measures as may be necessary; (*f*) that owners shall cause the teats of cows to be washed previous and after the said cows being milked, and that milkers wash their hands previous to milking each cow; (*g*) that market places be supplied with sufficient water, food, and shelter; (*h*) that all animals landed in the country from abroad be branded with such marks as shall indicate the country and port from whence they come; (*i*) that a board of specialists be appointed whose duty shall be to ascertain the nature of water or food which may be suspected of causing disease in animals, and report professionally on the state of health of animals.

Professor MCCALL, in proposing a vote of thanks to Professor Walley for opening the discussion, remarked that they appeared to be all of the mind that slaughtering should be continued. He thought they should all make a strong representation that it should be conducted under Government. Each

local authority was allowed to define for itself what it considered contact; some said one thing and some another, and the disease was allowed to gain in power. He was certain that until the Government took the matter in hand, and adopted some measures of the kind, they would not see the reforms which it was necessary should be brought about.

The vote of thanks was unanimously awarded, and the meeting terminated.

THE DINNER.

The members of the Society and a few friends dined in the Douglas Hotel in the evening. Mr. CAMPBELL, Veterinary Surgeon, Kirkcudbright, Vice-President of the Society, presided, and gave the usual loyal and patriotic toasts.

Mr. PHILLIPS, of the Army Veterinary Department, in responding to the toast of "The Army, Navy, and Reserve Forces," remarked that he thought the time had come when Government aid should be given to the veterinary profession, especially in prosecuting scientific research.

Dr. AITKEN proposed the toast of "The Royal College of Veterinary Surgeons," remarking upon the great progress of the veterinary profession, which embraced an ever-increasing class of intelligent men, who had received a good education in their youth; and he thought the time had come when the veterinary students should have a written as well as an oral examination.

Professor MCCALL, in acknowledging the toast, agreed with Dr. Aitken that it would be for the advantage of all concerned if there was a written as well as an oral examination.

The CHAIRMAN proposed "The Veterinary Schools," and Principal WALLEY, in replying, said that the proposal to have a written as well as an oral examination would come before the next meeting of the Council of the Royal College of Veterinary Surgeons. He said he would also do his best to press forward their claim to receive State aid, for it was a disgrace to the country that their institutions should not receive one sixpence from the Government.

The other toasts were "The Royal Scottish Veterinary Society," and "The Chairman," by Mr. PENDER, and "The Press, and Mr. Macdonald, of the *Farming World*," by Dr. MACFARLANE.

W. D. FAIRBAIRN, *Hon. Sec.*

ROYAL VETERINARY COLLEGE MEDICAL ASSOCIATION.

THE Annual General Meeting of this Association was held in the theatre of the College on the 23rd of October, 1889.

In addition to a large attendance of student-members, there were present the President (Prof. Penberthy), Secretary (Prof. Macqueen), Treasurer (Prof. Axe), Prof. Shave, and Messrs. Wilder and Byrne.

The annual report stated that sixteen papers had been read during the past session, and several very interesting *post-mortem* specimens introduced; also that Prof. Axe had delivered a very lucid and interesting lecture upon the operation known as Laryngo-tracheotomy, and that Prof. Brown had given a very pleasant and highly-instructive demonstration of the various micro-organisms by means of the oxy-hydrogen lantern.

The following silver medals were awarded:—

For best examination on all subjects of the curriculum (excepting Chemistry and Botany)	Mr. E. D. Johnson.
For the best essay read and defended before a meeting of the members, subject: "Protective Inoculation"	Mr. M. W. Gatward.

For the second ditto, subject: "Bacteria"	Mr. A. W. Stainton.
For best essay on "Tuberculosis, and its Prevention;" competition open to all student-members	Mr. F. E. Place.
For best essay on "Adulteration of Food Stuffs;" competition limited to members of Class A.	Mr. J. Toms.

The retiring President having delivered his address, thanked the members for the courtesy extended to him during his year of office, and congratulated them on the average attendance at the meetings being higher than in any previous year.

The election of officers for the ensuing session then took place and resulted as follows:—

President	Professor Penberthy.
Secretary	Professor Macqueen.
Treasurer	Professor Axe.
Vice-presidents	Members of the Teaching Staff of the College ex-officio.

Messrs. F. T. Oatway.	Messrs. J. R. Cox.
„ W. Pritchard.	„ R. Withers.
„ F. W. Wragg.	„ S. J. Rayment.
„ F. L. Somerset.	„ D. Pugh.
„ J. Rowe.	„ F. Hill.
„ A. Perkins.	„ F. Place.

Assistant Secretary .. .. Mr. F. E. Place.

Votes of thanks to the retiring officers for their services during the past year terminated the proceedings.

J. Macqueen, *Secretary.*
F. E. Place, *Assistant Secretary.*

THE BALTIMORE UNIVERSITY, U.S.A., SCHOOL OF VETERINARY SCIENCE.

The introductory lecture at the opening of the new school was delivered by Professor Ward, F.R.C.V.S., on October 1st, 1889, in the Lecture Theatre.

Professor Pierce B. Wilson, M.D.,* one of the Directors, introduced Professor Ward in the name of the Directors of the University in eulogistic terms, stating that Dr. Ward had been selected as the President of the veterinary faculty because his European had been substantiated by his American reputation as a leading veterinary authority, and as a citizen of the United States. His associates were known in connection with the Bureau of Animal Industry as good men; the other professors belonged to the medical faculty, of which he, the speaker, was one.

Professor Ward said—

Gentlemen,—As the president of the veterinary faculty, it is my duty as well as privilege to address you on this occasion. I will not follow the old-style custom by saying I would that it was otherwise, that the task had fallen in abler hands, etc., etc.; my powers of speech are inadequate to do, etc. No, but I will say that I shall do my best to make you understand what lies before you as students, and give you as concisely as possible an outline of the course of study you must and will have to go through, to obtain a fair knowledge of the art and science of veterinary medicine and surgery.

* Professor Pierce B. Wilson was a pupil under Professor Liebig.

As this is the opening day of a new branch of study in the liberal arts and sciences, I feel bound to preface my remarks to you by giving a short concise history of this branch of medicine, its importance to and connection with agriculture, with human medicine and public health, and its present condition or *status* in this country. Ancient history tells us that, in what was termed the classic ages of Greece and Rome, veterinary medicine was recognised as holding the closest relationship to agriculture. Plagues are referred to with serious comment. Xenophon, Virgil, Ovid, Homer, Hippocrates can vouch for such troubles, and Homer was the first sanitary inspector or health commissioner, for we are informed that he ordered the Grecian camp to be swept out clean, and that the refuse should be cast into the sea, with the object of staying the pestilence.

To go back further, Holy Writ gives serious references to murrains among herds and flocks.

Again, one of the early Christian poets, Severus, in his "De Mortibus Bovem," gives a very plaintive account of the cattle plague.

Possibly some of you here have seen Hogarth's "Enraged Physician," which was a very fair caricature of the horse-doctor and cow-leech of his time.

To approach near the eighteenth century, we find that Buffon, the great naturalist of France, urged doctors to study animal diseases, but his advice was slowly grasped.

It appears that M. Bourgelat, an advocate at Lyons, was the first man to develop a study of veterinary medicine, for he induced the Government to establish a veterinary school at Lyons in 1761.

France, therefore, led the way in the study of animal diseases in our modern times, and other European countries soon realised its importance and value, and established veterinary schools, but old England was the last to see it, and then, had it not been taken in hand by a few old farmers, years might have elapsed ere England had a school; however, these farmers started the Veterinary College at St. Pancras, London, in 1791. The usefulness of the teaching was soon recognised, not only by farmers and horse-owners, but by the English Government, for graduates received appointments in the army as commissioned officers, and the status of army veterinary surgeons has under the present Commander-in-chief risen to a proud position, the duties performed by the department in times of war and peace clearly demonstrating the value of this branch of the service, and to such extent that the Queen has conferred the Companionship of the Bath on several veterinary officers, and in civil life conferred the order of knighthood on a rural practitioner at Windsor.

I merely mention this as encouragement to aspiring veterinarians in this country of our own, for I am sure that, at no distant date, the value of a thoroughly organised army veterinary department will be truly demonstrated and formed, and the appointments made worth seeking after by good and educated men.

The profession is quite young in this country, having an existence of about a quarter of a century—the first school being, I think, that of Montreal, followed by one in Toronto, then New York, which has two now, then one in Harvard University, recently one in Pennsylvania University, and one in Chicago, making five schools in the United States proper.

The Bureau of Animal Industry has every reason to thank these schools for the service they have rendered it, by placing their graduates at its disposal for duty as Inspectors in carrying into effect the Animals' Contagious Disease Acts, for without these gentlemen to act as Inspectors, the Government would have found itself in sad fix; therefore here we have a very fair instance of the value of veterinary schools to our commonwealth. Perhaps

I should remark that the Governments of European countries established the schools, except England, as mentioned; there it was left, as it is and has been here, to develop under the usual laws of development from small beginnings by the exertions of private individuals; then the graduates rally round. Thus it was that the veterinary profession was raised up in England, and thus it is and has been here; however, it can no longer be considered *infra dig.* to belong to our profession; the position of men of culture has been attained by those gentlemen who by their deportment have commanded it. For surely as the barber-surgeon of old gave up, so also will the horse-doctor and cow-leech give place to the educated veterinarian.

Human medicine and animal medicine are so closely allied that a line of demarcation is difficult to trace; both are rich in researches of immense value, so that the closer the two professions are together, the better it must be for mutual advancement. In Europe, this intimacy has long since been established; still comparative pathological chairs have not been established, whilst comparative anatomy has been taught for years.

The leading medical men, past and present, took and take great interest in the veterinary schools and their advancement, and it seems this interest has spread over here.

If there is any country needing the services of truly educated men (scientifically and practically) to look after the live stock interests, it is this country. Look at the live stock emporium of the world, "Chicago"! you can count animals by billions, and their value by tens of billions. All this immense wealth is entrusted to duly-qualified veterinarians; for, remember, "quacks" are not eligible for Government appointments, "political diplomas don't count." Look again at Kentucky, what value in horse-flesh here! Look at our new fields in the American Kennel Clubs—"canine pathology"! why, the other day, I had a stud dog brought for treatment, valued at a *thousand dollars.* The field is wide, truly wide; the true labourers, however, are few.

This brings me to my words to you, the students or freshmen. Let me tell you that a modern veterinarian requires a fair English education, a knowledge of Latin and Greek, to realise the meaning of medical terms ever confronting him, and an acquaintance with German and French is valuable, for our best literature comes in those languages.

A knowledge of geology, agriculture, and botany are needed, to acquire a knowledge of the soils, poisonous plants, diseases of plants, and value of various grasses. Chemistry, organic and inorganic, quantitative and qualitative, must be grasped by you before a knowledge of Materia Medica and Therapeutics can be mastered, to become physicians; and besides curing disease, you will be in request as surgeons; every minor and major operation must be performed by the educated veterinarian; here a knowledge of anatomy will serve you, but remember you must not only learn *how* to operate, but *when* also, and when to *decline.* Therefore you must pay attention to your studies in Pathological Surgery.

To become pathologists you must apply yourselves to a study of physiology, a knowledge of functions. Histology teaches the minute structure of all organised bodies, and microscopy yields also a knowledge of the factors of disease termed bacteriology, and these studies mastered, you will become true pathologists.

Diseases of the eye and ear are very important and must engage your attention.

Hygiene also is necessary, for although we are rarely called in till our patients are real sick, we are often besought to advise how to keep the balance in health.

Forensic medicine is another branch of your study, but I see the Hon. R. Stockett Mathews is present he will tell you what that means, and

psychology also, which is down on your programme, as well as the principles of shoeing.

Now I have given you a fair outline of your work for three terms, a mental bill of fare which I hope will satisfy you; however, should any of you need more, you can have it *post graduate* at the "Johns Hopkins" in the next block.

I must remind you that every year is marked by progress, and that you must be found equal to the demand, or you will not succeed; you must love the profession you have chosen, take pleasure in your work, pride in doing the large and the small duties imposed on you, and in doing so honestly to work with a will and determination; remember the eyes of the world are on you and see your honest efforts, and it will assuredly reward you. In the battle of life you will find yourself engaged not only in battle against disease, but ignorance, empiricism, and prejudice will be in array against you in your labours in the cause of science. Let me beg you will bear in mind that "The shield of science will cover and protect you."

It has been truly said, "The clouds of ignorance may darken your course, but these will as certainly disperse before advancing knowledge as do the mists which enshroud the mountain-top before the rising sun."

In conclusion, allow me to assure you that, although the veterinary profession does not hold out any extraordinary honours in this country as it does in Europe, such as the election of the illustrious veterinarian, Henri de Bouley, to the Presidentship of the Academy of Sciences at Paris, you may gain many sincere and true patrons, who will stand by you unto the end of your professional life, and when your time comes to shake off this mortal coil you will close your eyes satisfied that your earthly pilgrimage has not been void or blank in good works and usefulness.

The address was received with applause.

The Hon. R. STOCKETT MATHEWS, one of the leading counsel at the Maryland bar, well known as one of the leaders in veterinary jurisprudence, among veterinarians, quacks, and horse-dealers especially, was called to the platform. He said it was a pleasure for him to live to see the day when veterinary medicine was recognised as a science in Baltimore, and educated men practising in it. He pictured quacks in court thirty years ago down to a very recent date, and explained how he had at all times denounced these low charlatans, many of whom had the barefaced effrontery to swear on oath they were M.R.C.V.S. of London, when he, the hon. gentleman, knew from reading Percivall's "Anatomy and Hippopathology," that such an ignorant wretch could never have seen the outside of the College even.

Mr. Mathews in a most eloquent and graphic manner pleaded for man's noble friend and servant, the horse, and man's true companion, the dog. Referring to psychology, he said the intelligence of these two creatures was so marked, and history tells us of remarkable instincts possessed, that a philosopher was obliged to reason on the subject. Forensic medicine should be studied, for in court the professional man who knew his science had the advantage, and his evidence went on the side of truth and justice, thus, such men are honoured and esteemed. He told the students not to let the hard names bother them; they were only Greek terms having a simple English meaning. He advised them to throw up all idleness, and going in for study in real earnest they would come out good men. Half measures would not do it, full time must be put in. Mr. Mathews was listened to with marked attention and most heartily applauded as he resumed his seat, thanking Professor Ward for the lecture he had delivered on behalf of the company.

The lecture theatre was nearly filled; several other educational bodies having their opening lecture at the same time, caused a few absentees, but in addition to the Directors, Faculty, and students, th re was a good sprinkling

of gentlemen interested in live stock. Captain J. D. Hill, of the Norfolk line, the well-known breeder of imported thorough-bred horses, was there along with the Hon. R. S. Mathews. Mr. E. Kearney, of the Monumental Stables, Messrs. Bye, Biedler, Thomas, Mullen, and others.

THE FIFTH INTERNATIONAL VETERINARY CONGRESS, HELD AT PARIS.

THIS Congress was opened at Paris on September 2nd, at the rooms of the Geographical Society, Boulevard St. Germain.

Dr. CHAUVEAU, President of the Organisation Committee, welcomed the numerous gathering, and particularly thanked those from beyond France for responding to the invitation of their French colleagues.

Professor NOCARD, General Secretary of the Committee, furnished details as to the origin of these Congresses and the work of the Committee, which in the present instance gave the following results: 635 veterinary surgeons had sent in their names, and of these 178 were foreigners, of which 48 were Belgians, 46 Swiss, 27 Spaniards, 8 English, 7 Italians, 7 Roumanians, 6 Dutch, 5 Russians, 4 Danes, 3 Austrians or Hungarians, 3 Americans, 3 Egyptians, 2 Luxemburgers, 2 Portuguese, 2 Japanese, 2 Germans, 1 Alsatian, 1 Swede, and 1 Norwegian.* He also mentioned the official delegations from Governments, municipalities, and the learned societies of foreign countries, and of French agricultural and veterinary societies; and specially alluded to the Minister of Agriculture, on the proposal of M. Tisserand, having given the Congress a grant of 3,000 francs (£120).

The PRESIDENT informed the meeting of the regulations prepared by the Committee, the fifteen rules of which were read and adopted; and in conformity with rule 3, he proposed the following as honorary members of the Congress: Dr. Willems, Hasselt; Dr. Hime, Bradford; Teisserenc de Bort, Vice-President of the Senate, and President of the Epizoöty Committee; and the following members of this Committee: Senator Jobard, Bernard-Lavergne, Councillor-of-State Becquet, Professor Brouardel, Professor Proust, Senator Leon Renault, Leblond, Poirat-Dubal, and Professor Verneuil.

The proposal was adopted with acclamation.

M. DECROIX proposed to add to this list of honorary members a venerable *confrère*, probably the oldest veterinary surgeon in the world, M. Renaudin, of Ville Evrard, who was now in his 105th year.

This proposal was also adopted with prolonged acclamation.

In the name of the Organising Committee, M. NOCARD proposed the following as Honorary Presidents: M. Pasteur, whose imperishable works have so powerfully contributed to the progress of veterinary medicine; Professor Röll, of Vienna, whose advanced age and health prevented him attending the Congress; M. Tisserand, the eminent administrator who had taken such a large share in elaborating the French law on sanitary police.

Professor PERRONCITO, of Turin, believed that he was the interpreter of all the members of the Congress in desiring that MM. Chauveau and Nocard, whose zeal and activity had assured the organisation and success of the Congress, should retain their posts of President and General Secretary. This was adopted with acclamation.

The Congress then nominated the following as—

* Only a portion of these foreigners attended the Congress, and there were only three from England.

Vice-Presidents:

Professor Degive, Brussels.
M. Jacops, Terremonde, Belgium.
Professor Berdez, Berne, Switzerland.
Colonel Potterat, Berne, Switzerland.
Professor Bang, Copenhagen.
Professor Perroncito, Turin, Italy.
Professor Thomassen, Utrecht, Holland.
Professor Semmer, Dorpat, Russia.
Dr. Fleming, London.
Professor Liautard, New York.
Professor Lopez Martinez, Madrid.
M. Fischer, Luxemburg.

Secretaries:

Professor Cadiot, Alfort.
M. Cagny, Senlis.
M. Leclainche, Alfort.
M. Pellerin, Alfort.
M. Jolly, Bellac.
M. Lucet, Courtenay.
M. Degois, Avallon.
M. Even, Sta. Catalina, Argentine Rep.
M. Roger, Roubaix.
M. Giubert, Chalons-sur-Marne.

Archivist.

M. Moulé, Paris.

The PRESIDENT thanked the assembly for the honour conferred upon him, and promised to give all his attention to directing the labours of the Congress in a good direction.

It was resolved that the questions should be discussed in the order in which they stood, and that the discussion of each should not extend beyond one sitting, so as to have all discussed within the time of the meeting.

The meetings were arranged for 8 a.m. every morning, and the afternoons were to be free, except on that day, the afternoon, of which was to be devoted to the subject of Tuberculosis.

Afternoon Meeting.

The President in the chair. Vice-Presidents, Degive and Perroncito.

The subject for discussion was the report of M. Arloing on "Tuberculosis Considered from the Special Points of View of Sanitary Police and Alimentary Hygiene."

M. ARLOING dealt in detail with the first part of his report, the purport of his remarks being to the effect that the basis of the sanitary police of Tuberculosis is slaughter of the affected animals, but this cannot be effected without compensating the owner. But before adopting this course, it was necessary to know what we were about to engage in, and Arloing appealed to the members of the Congress, and especially to the foreign ones present, to furnish information as to the prevalence of the disease.

PEUCH considered that the most certain way to recognise cases of bovine Tuberculosis and stamping out the disease, was to again include it amongst the redhibitory vices.

VAN HERTSEN gave the statistics of the Brussels abattoir for the first quarter of 1889. The percentage of tuberculous animals was—

1·2	per 1,000 for	oxen	.. ..	(9 in 7,219)
1·9	„ „	bulls	.. ..	(8 in 4,126)
19·9	„ „	cows	.. ..	(46 in 2,313)
0·14	„ „	calves	.. ..	(2 in 14,690)

Or 4·61 per 1,000 for adult bovines.

PERRONCITO supported the conclusions in the report.

THOMASSEN gave the following statistics from Amsterdam:—

Of 13,207 bovines, 268 were tuberculous, or 2 per cent.
Of 15,827 pigs, 63 were tuberculous, or 0·4 per cent.

At Utrecht, where there is not an abattoir, the percentage of cases observed was only 0·24 per cent. (8 in 3,250 bovines). In Saxony, according to Siedamgrotzky, the general proportion is 2 per cent.; but in the towns where slaughter-house inspection is compulsory the percentage is higher—16·6 at Frankenberg, 17·0 at Penig, 19·9 at Döbeln, 22·4 at Zittau. Tuberculosis is also more frequently observed in calves.

ARDERIUS BAUJOL stated that in Spain there are no statistics of the disease, but its contagiousness is generally believed in. Where there are abattoirs the veterinary surgeons return the number affected as 4 or 5 per 1,000. He supported the conclusions of the report.

EVEN said that in the Argentine Republic Tuberculosis was most frequent among the improved breeds recently imported. With them the proportion would be 10 to 15 per cent., as against 0.5 per cent. of the indigenous cattle.

LIAUTARD remarked that the disease made fearful ravages in the United States of America; it might be affirmed that 25 to 50 per cent. were affected, and they were often animals of very great value.

BANG stated that in Copenhagen the general statistics for last year gave a proportion of 6 per cent., though it was 16 per cent. for cows. The number of calves affected is small.

ROSSIGNOL inquired whether there was any inspection in the United States, and if human Tuberculosis was frequent.

LIAUTARD replied that there was inspection only in some towns, and total seizure was not practised. Every year there died of Phthisis from 500,000 to 600,000 people.

LAQUERRIERE affirmed that the malady has become very rare in the cattle-sheds in Paris. Its diagnosis is difficult, and even after death it is not rare to confound bacillary Tuberculosis with lesions which are only in appearance common with those of that disease.

LEFEVRE was of opinion that the abattoir statistics are below the reality. In certain regions tuberculous cows are collected by army contractors. This is an evil.

VAN HERTZEN thought that troops were less exposed to danger than was believed, as they only ate meat which had been boiled for a long time.

BAYRON mentioned that at the Montauban abattoir the proportion was 6 per 1,000.

POLLET remarked that in the North of France Tuberculosis is frequent among cattle and people.

SEMMER announced that the disease was unknown among the indigenous cattle of Southern Russia, but it was very frequent among those of Northern Russia, which were imported and kept in sheds; sometimes as many as 50 per cent. were affected. There is no law against the consumption of tuberculous flesh.

CAGNY confirmed the statement of M. Lefèvre—if diseased cattle were sent to the abattoirs they would be seized.

VILLAIN said that in the Paris abattoirs the percentage was from 5 to 6 per cent.

VINCENT reported that at Bucharest abattoir the proportion of tuberculous animals, which was only 2 per cent. at one time, rose to 30 per cent. when a small compensation was not given to the owners. The disease affects cattle of the same breed as those of Southern Russia.

BERDEZ thought that the abattoir statistics were too low. Those of Lydtin and Siedamgrotzky gave 3 and 4½ per cent. as the number of live diseased cattle. The Swiss veterinary surgeons estimated that 5 per cent. of the cows kept in sheds were tuberculous. According to medical men, the proportion of tuberculous people in towns varied from 12 to 25 per cent.

ROBINSON has adopted at Greenock, since 1874, the principle of total seizure. At first he seized from five to ten diseased animals per week, but at present he scarcely saw one in fifteen days; they are sent to be killed elsewhere.

ARLOING summed up the discussion. Every one recognised the danger and the necessity of meeting it, and this being so, should slaughter or sequestration be recommended?

CHAUVEAU pointed out that the discussion showed that the frequency of the disease varied much, according to the region, and that in voting they should adopt a principle, leaving to each country the mode of applying it. He therefore proposed to the Congress the adoption of the following proposition:—

"*In every country, animal Tuberculosis should be included among the contagious diseases which are the subject of sanitary laws.*"

This proposition was unanimously adopted.

LEBLANC remarked that the present French law did not give good results; it was necessary to perfect the diagnosis, generalise inspection of slaughter-houses, and compensate owners.

ARLOING then rapidly dealt with the second part of his report, treating of *alimentary hygiene*. He alluded to the experiments which proved the dangers attending the use of the milk and flesh of tuberculous animals, and concluded with insisting upon the necessity for interdicting the consumption of the flesh of every tuberculous animal, no matter in what stage of the disease it might be.

NOCARD contested the signification of the experiments, so far as the flesh is concerned. There has not been a good experiment proving that the ingestion of the flesh, destitute of *tubercular products*, may give rise to Tuberculosis. We cannot conclude from the results of injection into the peritoneum of the guinea-pig as to the danger of ingestion by man. To destroy such a great quantity of good flesh is an economic crime. If it is desired to avert all danger, even theoretical, the meat should be thoroughly salted, and when it is to be consumed it ought to be submitted to prolonged cooking; this would reassure the most timid. As to the milk every one was agreed.

HEU remarked that it was solely due to defective organisation that the law did not yield good results.

BAILLET affirmed that total seizure can only be practicable when the owners are compensated and the inspection of flesh is generalised.

BUTEL supported the views of Baillet, and mentioned the results obtained in France by the inoculation or ingestion of the blood, milk, and muscular juice of tuberculous animals. He energetically insisted upon total seizure.

DEGIVE refuted the arguments of Nocard. The intra-muscular lymphatic glands are as dangerous for man as for animals; and with regard to salting, so far from the flesh requiring complete cooking, it rather tempted people to consume it raw.

STUBBE'S experiments had yielded one positive result in four. He was an energetic partisan of total seizure.

DECROIX was not convinced. He continued to eat flesh and drink milk without taking any special precautions.

PERRONCITO was desirous that great quantities of good flesh should be saved from destruction; if salting would not suffice, why not have recourse to coction? The duty of the hygienist is completed when he can give assurance of the innocuousness of the food.

WEBER supported that view.

VAN HERTSEN had been fighting for a long time against Tuberculosis in all its forms, but hitherto without success. He had tried coction; this would be efficacious, but who would eat such food? The poor? Never!

THOMASSEN pointed out that the experiments made at Amsterdam proved that salting did not destroy tubercular virulence.

ARLOING did not think it necessary to reply, as the meeting appeared to have made up its mind; and he therefore asked that the conclusions given in his report should be put to the vote.

With the exception of four votes, the assembly adopted conclusion *a*, thus formulated: "*There is cause to eliminate from human and animal consumption the flesh of tubercular creatures, mammals and birds, no matter what the degree of Tuberculosis may be, nor yet the apparent qualities of the flesh.*"

The amendment of Perroncito, tending to permit the use of the flesh after complete coction, was not adopted.

The Congress then successively adopted propositions *b*, *e*, *f*, and *g* of Arloing's report.*

With regard to conclusion *d*, the Congress only accepted it in principle: "*Owners of cattle and pigs should receive compensation.*"

The PRESIDENT was gratified with the result of this sitting, as it accorded with the views of the Congress on Tuberculosis, the promoter of which was M. Butel.

NOCARD announced that the members of the Congress were invited to visit the Pasteur Institute the following Sunday; in the absence of M. Pasteur M. Roux would do the honours.

ROYAL AGRICULTURAL SOCIETY.

AT the Monthly Council Meeting held on November 6th, Sir JOHN THOROLD (Chairman) presented the usual monthly report of Professor Brown, and the quarterly report of the Royal Veterinary College, which were ordered to be published with the proceedings of Council.

The Committee had discussed at some length the continued prevalence in the country of Pleuro-pneumonia, and had decided to recommend that the following resolution be adopted by the Council and forwarded to the Board of Agriculture:—

"That the Government should take action in regard to Pleuro-pneumonia, and that they should apply the necessary measures for stamping out the disease at the cost of the Imperial Exchequer."

The Committee had also considered the present unsatisfactory nature of the precautions taken against Swine Fever, and decided to recommend the adoption of a second resolution as follows:—

"That this Council beg to call the attention of the Board of Agriculture to the continued spreading of Swine Fever, and to the want of uniformity in the regulations which are issued by the various local authorities for the purpose of checking the disease."

Copies had been laid upon the table of a Report, received from the Board of Agriculture, by the Chief Travelling Inspector of the Privy Council, on the subject of the transit of cattle from Ireland to Great Britain, and containing remarks on the suggestions which were made by the conference of representatives of the three national Agricultural Societies held on the 28th and 29th of March last. The following resolution in regard to Tuberculosis had been received from the Council of the Royal College of Veterinary Surgeons:—

* b. *That the utilisation of the hides and horns of tubercular cattle may be allowed after they have been disinfected, and the use of the suet also if necessary.*
e. *The milk of tubercular cows should not be allowed for human food.*
f. *Dairies kept in or about large towns should be properly inspected.*
g. *Everything possible should be done to induce consumers to boil milk the source of supply of which is not known.*

"That in the opinion of this Council Tuberculosis in animals should be dealt with as a contagious disease, in so far at least as actually affected animals, or animals suspected of being affected with the disease, are concerned."

The Committee recommended the appointment of Mr. J. Dawson Roberts, of Aberystwith, as Provincial Veterinary Surgeon for the county of Cardigan, and that a horse-shoeing competition be held in connection with the Plymouth Show, in two classes, viz., hunters and agricultural horses, the competition to be limited to the district in which the show is held, *i.e.*, District D (Berkshire, Cornwall, Devonshire, Dorsetshire, Hampshire, Kent, Somersetshire, Surrey, Sussex, and Wiltshire).

Sir JOHN THOROLD then gave notice that at the next meeting of Council the Committee would move for the renewal of their annual grant of £500, of which sum £200 to be granted to the Royal Veterinary College.

On the motion for the adoption of the Committee's Report, Mr. BOWEN-JONES said that it would have been more consonant with the feelings of those who had taken some interest in the question of Pleuro-pneumonia if a more decided policy had been laid down by the Committee in their report. Recommendations were given which to his mind were not sufficiently explicit with regard to that disease. He understood that the Committee desired the transference of the administration of the Contagious Diseases (Animals) Act with regard to slaughter for Pleuro-pneumonia from the local authorities to the central authority. He endorsed this opinion himself fully, but he should like to see it expressed instead of being left to be understood, and he should be glad if the Chairman of the Committee would accept an amplification of the resolution in that sense. He thought that if the resolution referred definitely to slaughter under Imperial control, it would then express exactly the opinion of those who believed that the only method of getting rid of Pleuro-pneumonia was by slaughter and by the administration of the Slaughter Act being placed in the hands of the central authority, instead of in those of the local authorities. As they were fully cognisant, it was in consequence of the inefficient administration of the Act by the local authorities that Pleuro-pneumonia had not been stamped out of the country.

Sir JACOB WILSON gladly seconded the proposal of Mr. Bowen-Jones, who was merely asking for what had already been granted by the Council at a previous meeting, and which was thoroughly in accordance with the recommendations of the Government Departmental Committee on Pleuro-pneumonia.

Mr. DENT desired, as he did this time last year, to call the attention of the Council to the slaughter of animals affected with Pleuro-pneumonia. He was aware that he took an exceedingly unpopular view. He had held this view for a long time, he still held it, and he supposed he always should. The opinion appeared to be gaining ground all over the country that the way to get rid of the disease was probably to slaughter everything, or as a member of his own County Council had said, "You must slaughter all the animals in the country to keep any alive." There was a letter in yesterday's *Times* pointing out the extravagant expenditure that had taken place in a great many counties. The writer, quoting from the last annual taxation return, gave for the three years ended 1886-7 an average expenditure of £85,118 in carrying out the Contagious Diseases (Animals) Acts. He was not sure whether that figure applied to the whole of Great Britain, or only to England. He believed that since the Slaughter Order had come into operation that expenditure had been doubled. He was sure it was so as regards the West Riding of Yorkshire. When he brought this matter forward last year, Professor Brown had told him that there had been a decided decrease in the number of diseased animals in the West Riding. Instead of any decrease there was an increase in the number of animals affected, and an increase in the number of animals

slaughtered both affected and in contact. The figures he had for the West Riding of Yorkshire from March 10th, 1888, at which period the Slaughter Order came into operation, were as follows:—Ninety-four infected animals slaughtered, loss £900; 616 healthy animals in contact slaughtered, loss £4,361 4s. 9d. He believed that in the majority of cases the animals were healthy at the time of slaughter. There was not merely the effect upon the rates, but there was the very serious loss and damage to the persons interested. The outbreaks in his district were amongst small owners and dairy proprietors, whose animals could not be replaced at the compensation valuation, nor their milk trade replaced, and who were therefore at very serious disadvantage and loss. They must remember that this matter was no longer in the hands of the landlords and magistrates; many of the members in his County Council were representatives of the pitmen, who did not look upon the matter as they did. They would find that they had a very different class of bodies to deal with. This would not affect ordinary agricultural counties, but in a great manufacturing county like Yorkshire, where there were four or five authorities, there was great difficulty in getting them to act under a proposed central authority, the compensation being paid out of the local rates. He saw there the President of the new Board of Agriculture, and he begged to congratulate him upon that office, for which he believed there was no one more fitted. He hoped that before Mr. Chaplin gave any definite decision on this point he would look very carefully into the matter. He thought the Act had been passed for the benefit of veterinary surgeons more than anything else, seeing the money which it placed in their pockets. He did not wish to say anything against the veterinary surgeons, who, as a rule, were men of honour and of good education, but the Act gave them every inducement to declare disease. In every outbreak notice must be given to the police, who must give notice to their superintendent, who in turn must call in a veterinary surgeon. They had therefore to pay both for the police and for the veterinary surgeons. It was no use the county authority carrying out the Slaughter Order unless the borough authority did so too. He did hope that the President of the Board of Agriculture would look very carefully into the whole administration of this Act. They (in Yorkshire) thought that the Slaughter Order as regarded animals that had been merely in contact should be revoked. It was found in many cases, on post-mortem examination, that the animals condemned by the veterinary surgeons of the Privy Council were perfectly healthy at the time of slaughter.

Sir JOHN THOROLD said Mr. Bowen-Jones had appealed to him as Chairman of the Veterinary Committee, as to whether he would accept an amendment to the Committee's resolution. The resolution had been discussed at length at the Committee yesterday, and it was felt that it was better, in any decision they might adopt, not to hamper the decision of the Government, with whom the entire responsibility rested.

Lord EGERTON OF TATTON said that the Committee did not wish to fetter the action of the new Board of Agriculture either in regard to Pleuro-pneumonia or Swine Fever, but to call attention to the state of things that existed, and to leave the Board of Agriculture to find the remedy. In Cheshire they took a diffrrent view to that which Mr. Dent took in regard to the West Riding of Yorkshire. They always acted promptly, and if the local authorities did not act promptly, then they got into considerable expense for the great number of animals which they had to slaughter. The Chairman of the Veterinary Committee in his own County Council was a tenant-farmer, and as far as his (Lord Egerton's) county was concerned, no change had occurred in consequence of matters being now dealt with by an elective body instead of by the magistrates. They should be only too glad if some central authority could carry out promptly and uniformly those orders which were believed

to be necessary. Promptitude in action and uniformity amongst the different local authorities were absolutely necessary to success in this matter.

Sir JACOB WILSON said that the Council were very considerably indebted to Mr. Dent for the lucid manner in which he had put and explained the other side of the question, which had sometimes been kept in the dark. Before his right hon. friend on his right (Mr. Chaplin) took action, that other side of the question should be most carefully weighed, but he would further say that he had listened with great interest to Mr. Dent's objections. He heard them with satisfaction because the arguments used by Mr. Dent were the strongest arguments in favour of the course proposed by the Committee. It was in view of the want of uniformity amongst the various local authorities that the present state of things ought to be put a stop to. The time had come when the country ought to rise on all sides, whether they were consumers, tenant-farmers, or landlords, or whatever position of life they occupied, and try to expel that scourge, which was an imported scourge, and which it was proved had been expelled from foreign countries by means of slaughtering where every other experiment had been tried without success. He hoped the Council would accept Mr. Bowen-Jones's suggestion, and that it would go with the fullest possible force to the Government of the day.

Sir NIGEL KINGSCOTE thought it would be better to leave the Government to take their own measures. He seconded this resolution in yesterday's Committee, and, though he felt very much indebted to Mr. Dent, yet he could not agree that his view of the question was the correct one. He felt certain that, as long as this disease was allowed to wander about the country by the inefficient measures of the local authorities and by prompt action not being taken, it would remain unchecked.

After some further discussion, the resolution as amended by Mr. Bowen-Jones was put to the meeting, and declared carried in the following terms:—

"That the Government should take action in regard to Pleuro-pneumonia, and that they should apply the necessary measures for stamping out the disease by slaughter under Imperial control, and at the cost of the Imperial exchequer."

Mr. DENT said that he wished to record his vote against a resolution which pledged them to the principle of slaughter, and asked Mr. Chaplin, as President of the Board of Agriculture, whether it would be possible for a return to be made of the number of outbreaks of Pleuro-pneumonia, the number of diseased cattle, the number of diseased cattle slaughtered, and the number of healthy cattle slaughtered since the Order came into operation.

Mr. CHAPLIN replied that he could not speak positively at the moment, but he had not the slightest doubt that it could be done, and he promised to give the matter his consideration.

Report on the Prevalence of Pleuro-pneumonia, Anthrax, and Swine Fever.

Pleuro-pneumonia.—Between July 20th and October 26th, a period of fourteen weeks, 148 fresh outbreaks of this disease were reported in Great Britain—sixty in England, and eighty-eight in Scotland. The counties in England in which outbreaks occurred during this period were Chester, Essex, Herts, Kent, Lancaster, Leicester, London, Middlesex, Norfolk, Northampton, Suffolk, Surrey, Sussex (East), and York (W.R.). In Scotland outbreaks have been reported in Aberdeen, Ayr, Edinburgh, Fife, Forfar, Inverness Kincardine, Lanark, Linlithgow, Perth, Renfrew, Ross, and Stirling. The total number of cattle attacked in the fourteen weeks was 526, of which 162 were in England and 364 in Scotland. In addition to the above, 2,085 healthy cattle which had been exposed to infection were slaughtered; 798 of

these were in England, and 1,287 in Scotland. In Ireland during the same period twenty-one outbreaks of Pleuro-pneumonia were reported. Thirty-three cattle were attacked, and 188 healthy cattle which had been exposed to infection were slaughtered.

Anthrax.—Forty-five outbreaks of Anthrax were reported to have occurred in Great Britain during the fourteen weeks. Thirty-nine of the outbreaks were in England, and fifty-nine animals were attacked. In Scotland only six outbreaks were reported, and nine animals were attacked. The cattle which were referred to in the last report as having been inoculated with cultivated virus of Anthrax to protect them from the natural disease have remained in good health.

Swine Fever.—In Great Britain, 1,364 outbreaks of this disease were reported during the fourteen weeks; 7,144 swine were attacked, 3,506 diseased pigs were killed, 2,957 died, 679 recovered, and 371 remained alive when the return was made up. This is a decrease on the returns for the preceding three months. A similar decrease has been noted in Swine Fever about this season for the past seven or eight years.

Quarterly Report of the Royal Veterinary College.

Experimental investigations on the diseases of Swine Fever, Blackleg in young cattle, and Tuberculosis in various animals, including poultry, and also on the development of the lung worm, were carried on during the last quarter, and some inquiries were made for members of the Society in regard to outbreaks of disease among farm animals. Cases of Actinomycosis, Tuberculosis, and Broncho-pneumonia in cattle were received into the infirmary.

In regard to Swine Fever, it is to be remarked that the experiments which have been made with the various organisms found in the diseased organs have not been followed by any positive results. For example:—a portion of the spleen of a diseased pig will cause Swine Fever in a healthy pig; while the micro-organisms which are cultivated from a similar portion of spleen have been introduced into the system of healthy swine without causing any illness. This is contrary to what was expected, and further experiments will have to be made in the same direction. It is obvious that until the organism which causes Swine Fever has been isolated, there is no possibility of obtaining a modified virus for the purpose of protective inoculation.

Investigations in reference to protective inoculation for Blackleg (Symptomatic Anthrax) were attended with contradictory results. The virus prepared by Messrs. Arloing, Carnevon, and Thomas was used as directed, but test inoculations with active virus, and also with dried juice of muscle from an animal dead of the disease, were followed by development of Blackleg in some of the protected calves, while others which were not protected by previous inoculation, were unarmed by inoculation with dried and fresh muscle juice. These experiments will be more fully referred to in the Annual Report.

Tuberculosis.—Recently public attention has been much excited on the subject of the danger of infection from eating flesh of tuberculous cattle, or drinking the milk, and it is specially to be noticed that the demands which have been made for legislative protection have been limited to cattle. Scientists are, however, well aware that swine and sheep are liable to infection, and there is no doubt of the remarkable susceptibility of poultry to the disease. In a large number of cases, the livers of fowls have been found to contain the characteristic tubercle bacilli in large number, and it has come to be considered that tubercle is limited to that organ in poultry. A specimen of a fowl which was suspected to have died of Tubercle was sent to the College for examination, and a few tuberculous spots were found in the

liver; but on further examination in the Bacteriological Laboratory of King's College nearly all the organs of the body were found to be affected, and the lungs were much worse than any other parts. This fact is extremely significant, as the lungs, from their protected position in the chest, are never removed, as other organs, before the fowl is cooked, and further it is the case that the lungs are generally under-cooked, and in this state they are eaten as a delicate morsel. It would appear, then, that the danger to public health from tuberculous meat is at least as decided in regard to diseased fowls as to tuberculous cattle, sheep, and swine.

Since the last quarterly report was laid before the Council, further inquiries have been made with regard to the development of the *lung-worm* of cattle and sheep, and it may be said that some advance has been made in the knowledge of the life-history of the parasite. Earth-worms from districts in which parasitic lung disease appears every autumn, or earlier if the season is wet, were found to be free from embryos during the dry hot period of the summer. As soon as the disease reappeared among calves and lambs after a considerable rainfall, the earth-worms again became infected, and the presumption is that they expel the embryos after they have advanced to a certain state of development, probably in the early part of the spring. The embryos remain dormant during the dry season, but on the occurrence of rain, become active, and in this state are taken up by grazing animals.

Investigations are being conducted with the view of isolating the organism of Pleuro-pneumonia of cattle. It has been claimed by several investigators that the microbe has been discovered. Mr. J. Poels, Dr. W. Nolens, of Rotterdam, and M. Arloing, of Lyons, are among the claimants. M. Pasteur carried on the investigation for some time, but abandoned it presumably on account of the difficulty of defining any one of the many organisms which are constantly entering the lungs as the disease-producing microbe. The investigation is not, therefore, a very hopeful one, but there is always the chance that of a number of inquirers one may succeed in isolating the organism.

The College Infirmary continues to be well supplied with cases of disease in cattle, sheep, and swine, to the manifest advantage of the students.

(Signed) G. T. Brown, *Principal.*

FELLOWSHIP EXAMINATION OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

An examination for the Fellowship Degree took place in October, when two members were successful in passing, viz., R. W. Burke, Army Veterinary Department, and T. C. Toop, Knaresborough.

The examiners were Professors Brown and Duguid, and Dr. Fleming. The following were the questions.

General Pathology and Veterinary Medicine.

1. What conditions are necessary to establish the fact that a Disease is contagious?
2. Describe the Symptoms and Post-mortem Appearances in Swine Fever.
3. What circumstances are favourable to spreading of Contagious Diseases?
4. What are the Distinctive Symptoms of Glanders, and what tests can be applied to prove the Nature of the Disease in doubtful cases?
5. What is the Nature of "Husk" in Calves and Lambs, and what changes are seen in the Lungs in fatal cases?

6. In what parts of the country, and under what conditions, is Husk most prevalent?

Pathology.

1. Describe Tetanus with regard to (1) its Nature and Causation, and (2) its Anatomical Characteristics, and, when the disease terminates fatally, the Cause or Causes of Death.

2. Describe Pleurisy in the Horse with regard to Causation and Anatomical Characters.

Epizoötiology.

1. What is meant by the term Influenza? How does it usually manifest itself (1) as to Geographical Extension, and what are the Forms it assumes?

2. What are the measures necessary for the Suppression of Bovine Tuberculosis, viewing it as a contagious disease? and what steps should be taken to safeguard the Public Health in regard to the Flesh and Milk of affected animals?

3. How would you distinguish between Bovine Contagious Pleuro-pneumonia and Bovine Tuberculosis in the living animal?

(One question in each subject must be answered.)

Comparative Anatomy and Physiology.

1. Give the Distinctive Characters of the Animal and Vegetable Kingdoms.

2. Give an account of the Modifications of the Heart in the different classes of Vertebrata.

3. Describe the Characteristic Features of the Dentition of the Horse, Ox, Sheep, and Pig.

4. Give the number of Pulsations per minute in the Horse, Ox, and Dog, and state how the Pulse Wave is produced in the Artery.

5. Describe the Structure of the Mucous Membrane of the Small Intestine, and state how the absorption of Chyle takes place from its surface.

6. What is the Specific Gravity of the Urine of the Horse? Name its Normal Constituents and the Sources from which they are derived.

Therapeutics.

1. State the circumstances under which Purgative Medicines are indicated in the Treatment of Disease, and also those in which their administration may be followed by injurious effects.

2. What are the Physiological Actions of Digitalis and Arsenious Acid? State under what circumstances they may be used in Veterinary Medicine.

NOTE.—*Four of the six questions on Comparative Anatomy and Physiology, and at least one of the two on Therapeutics, to be answered.*

Army Veterinary Department.

Gazette, November 19th.

Veterinary-Surgeon, First Class, W. Burt, has been placed on temporary half-pay, on account of ill-health.

Veterinary Surgeon, First Class, W. R. Walker, has embarked for a tour of service in India, and Veterinary Surgeons Lardner and Newsom are under orders to embark for that country.

Inspecting Veterinary Surgeon Oliphant has arrived from India, and is posted for duty at Aldershot.

VOLUNTEER ARTILLERY.—The appointment of Veterinary Surgeons to Volunteer Batteries of Position, has been under consideration with regard to the capitation grants for officers. The officers of Batteries are allowed, under ordinary circumstances, a certain grant of money which goes to keep up the equipment, etc., but a special capitation grant is given in addition, for proficiency. Medical officers receive this grant when they have passed an examination in ambulance organization; but with regard to Veterinary Surgeons this allowance could not be claimed hitherto, as they have no organization of this kind to master.

It has now been decided, on the recommendation of the Principal Veterinary Surgeon, that to earn the Special Capitation Grant, Veterinary Surgeons who have not served as such in the Regular Army, must be Fellows of the Royal College of Veterinary Surgeons. Those who have served in the Regular Forces can receive the special grant without obtaining the Fellowship.

YEOMANRY CAVALRY.—Appointment of Acting Veterinary Surgeons. It has been at times complained of in this Journal, that in some Yeomanry Cavalry Corps, Veterinary Surgeons were only privates, though acting professionally. Representations having been made to the Horse Guards with the view of removing this indignity, the following General Order has been issued: "An acting Veterinary Surgeon will be allowed to every regiment which is not entitled by its establishment to a Veterinary Surgeon; but such acting Veterinary Surgeon will only receive the pay of a Yeoman, and will be in lieu of one of the number of non-commissioned officers and men authorised by the establishment." This Acting Veterinary Surgeon has, of course, the rank, and wears the uniform, of an officer.

It may be mentioned that efforts are being made to assimilate the Veterinary Surgeons in the Auxiliary Forces with those of the Regular Army, so that they may be included under the same organization, wear the same uniform (silver instead of gold lace), and obtain promotion by length of service.

Obituary.

MUCH sincere regret on the part of all, and of sorrow with many in the profession, will be experienced at the announcement of the death of Edward Coleman Dray, F.R.C.V.S., Honorary Treasurer of the Royal College of Veterinary Surgeons, which melancholy event occurred on October 27th, at his residence, Spencer Villas, West Hill Road, Wandsworth, at the advanced age of eighty years. Though evidently in ill-health for some time, our lamented friend held out nearly to the last in transacting his official duties and taking his usual exercise, being only for a short time confined to his bed. It is scarcely possible to do justice, in a brief notice like this, to the good qualities of this most estimable colleague; but the few remarks we venture to offer may be acceptable to our readers as a tribute to the memory of one whose career was that of an honest and honourable man. Mr. Dray was born in 1809, at New Hall, Dymchurch, Kent, and was educated at Hythe; when fourteen years of age he was articled to his brother-in-law, a barrister in London. For two years he lived in chambers in Lincoln's Inn, but upon the death of his relative he gave up the law, and his godfather, the late Professor Coleman, induced him to enter the Royal Veterinary College, where he studied, and in due course passed a successful examination in 1836. He then went as an assistant to a practitioner in Sheffield, where he remained for some time; but an opportunity occurring for establishing an independent practice in Leeds, he transferred himself there. By dint of his sterling qualities he earned the confidence and esteem of those who sought his

advice and services, and rendered himself very popular as a citizen of that important town until 1871. His cultivated tastes, and especially his predilection for music, made him much sought after, and for many years he was the moving spirit of the Leeds Musical Society. Gifted with a good voice and great taste, he was something more than an amateur vocalist; while his sound judgment and readiness to promote musical teaching gained him the acquaintance and friendship of several of the musical celebrities of those days. Among these was the well-known composer and basso, Mr. Weiss, who dedicated his beautiful and perennial song, the "Village Blacksmith," to our deceased friend. In spending his few leisure hours in this manner, Mr. Dray did not neglect his extra-professional duties. Working in harmony with his brother practitioners, he was an energetic agent in establishing the Yorkshire Veterinary Society, of which he was the first President for two successive years. In 1871 he retired from the profession, so far as actual practice was concerned, and leaving Leeds, he settled in the locality in which he died. For twenty-eight years—from 1861 to 1889—he was continuously connected with the Council of the Royal College, and during the long time he filled the office of President, Vice-President, member of Council, and Treasurer. In all these positions he rendered excellent service, and especially while custodian of the funds of the Corporation, of which he was scrupulously careful. In everything pertaining to the welfare of animal medicine and its votaries he took a deep interest, and to the end of his life this was evident. He was one of the connecting links, of which few now remain, that bound the early to the later days of veterinary science in this country, and he was in every respect a worthy representative of what our real professional pioneers were. As such, and as one also who never got behind the times, he will, it may be predicted, be long remembered for his loyalty to the Royal College of Veterinary Surgeons.

Another of our colleagues, only a year junior to Mr. Dray in the profession, though five years younger, has died under somewhat melancholy circumstances. Mr. Thomas Hurford, M.R.C.V.S., late of the Army Veterinary Department, died suddenly in the Royal Artillery mess-room, on November 6th. He was born in 1814, graduated in 1837, and entered the Army as Acting Veterinary Surgeon in 1838. In 1839 he was gazetted to the then 15th Light Dragoons (now 15th Hussars), and was transferred to the 12th Light Dragoons (now 12th Lancers) early in 1854. He was promoted to Veterinary Surgeon 1st Class in 1859, and made Staff Veterinary Surgeon in the same year. In 1871 he was placed on retired pay. Embarking for India in 1839 with the 15th Dragoons, he remained with that regiment until it left India, when he joined the 12th Lancers, and accompanied it from that country to the Crimea, to which it went by the overland route through Egypt—a march which, until that year, had never been accomplished by British cavalry. After the Crimean War he returned to India. Towards the end of the war in China, he was sent out to that country as Principal Veterinary Surgeon, but arrived too late to share in the field operations. He was much devoted to field sports, and since retirement took a considerable share in their maintenance in the Woolwich garrison. In recognition of his services in this direction, the Royal Artillery presented him with a testimonial a few years ago.

Veterinary Surgeon T. Pottinger, M.R.C.V.S., Army Veterinary Department, died at Bombay on November 2nd. Graduating in 1881, he became demonstrator of anatomy at the Royal Veterinary College, and in 1883 he joined the Army. After the usual probationary period at Aldershot, he embarked for a tour of service in India, acting for some time as a teacher at the Bombay Veterinary School.

Owen Thomas, M.R.C.V.S., who graduated in 1863, died at Biggleswade, Bedfordshire, on November 12th.

The deaths have also been reported of H.-Newsome, M.R.C.V.S., Suffolk, a graduate of 1865; and A. R. Simpson, M.R.C.V.S., Dublin, who graduated in 1875.

Notes and News.

A Remarkable Jump of a Horse.—While driving in Central Park, New York, recently, Mr. Meuller, of Dickel's Riding Academy, New York, had an astonishing experience, and discovered a new jumper. His horse, a young brown mare, became frightened, and, after two unsuccessful attempts to check her, succeeded in getting beyond control, and dashed wildly towards the Eighth Avenue exit. Realising his danger, Mr. Meuller headed the mare towards the stone wall that separates the park from Fifty-ninth Street, between Seventh and Eighth Avenues. On approaching the wall with increased velocity the mare, instead of coming to a stop, "took off," and cleared the ditch and wall, landing on the sidewalk on Fifty-ninth Street, the hind feet on the balustrade and the dog-cart in a perpendicular position against the wall, the measurement of which is 7 feet 11 inches. She "took off" from a bank 10 inches high, making the length of the leap, from point of "taking off" to highest, 11 feet, a remarkable jump indeed for a novice, especially in a dog-cart. The animal bids fair to become a competitor for the championship. Mr. Meuller's only injury was a slight cut on the chin—a remarkable escape. The spectators described it as a very thrilling experience to witness. —*Field, Turf, and Farm.*

Foot-and-Mouth Disease in Germany.—Foot-and-Mouth Disease has again been discovered at two of the principal cattle-markets of Germany, *i.e.*, Berlin and Leipsig. The disease, it is said, has been brought over from East Prussia by pigs. The authorities at Berlin are about to erect isolated buildings in that city, where diseased or suspicious cattle will be immediately dealt with.

Dogs as Despatch Carriers.—In the Dutch East Indies dogs, suitably trained, have been employed to carry telegraph messages from Keta-Kadiji to Pakan-Kroeng Tyœt, when from any cause the telegraph wire was not available. The messages were concealed with their collars, and were conveyed the six kilometres (about 3¾ miles) in ten minutes, being about 656 yards per minute.

Texas Fever.—What was called Red Water, but which, we believe, was Texas Fever, caused the death of 119 head of cattle out of 770 on board the ship *Oxenholme*, which arrived at Liverpool from Boston lately.

Acetic Acid as an Antiseptic.—Dr. F. Englemann, in *Centr. f. Gyn.*, claims that acetic acid possesses equally as good antiseptic qualities as carbolic acid; in fact, that it is to be preferred, as it is completely harmless, even if used in concentrated solutions, and that it is a valuable hæmostatic, an advantageous addition, particularly in obstetrics. Another important property is its ease of transition into the tissues, which, according to Englemann's experiments, is far greater than that of all the other antiseptics. Of bichloride of mercury it is well known that it forms an insoluble combination with albumen, and can therefore act only on the surface, while acetic acid extends into the deeper tissues with ease. Acetic acid also affects the metal of the instruments, but not so severely as the bichloride of mercury; the forceps, for instance, may be placed for a quarter of an hour in an irrigator filled with a 3 per cent. solution of acetic acid without being injured. A pleasant effect of acetic acid is that it softens and lubricates the

skin. Englemann generally used a 3 per cent. solution. At times he has made use of a 5 per cent. solution, which would easily cause a painful burning where sores were present, so that he only used the latter strength in septic cases, as the 3 per cent. solution proved to be a satisfactory antiseptic for general purposes.

SWINE PLAGUE.—The so-called "Hog-cholera" is raging with fatal effect in Wilson County, and many farmers have lost their entire stock of hogs. There are other portions of Southern Kansas in which the loss of hogs is great from the same disease.

PROTECTIVE INOCULATION AGAINST HYDROPHOBIA.—In the year ending October 31st, 1,810 patients bitten by dogs were treated at the Pasteur Institute in Paris. There were thirteen deaths.

WOOD-MEAL AS FORAGE.—"Wood-meal" flour is now used in Austria as food for horses and cattle. The meal is said to have a greater nutritive value than straw, and where the latter is scarce the wood-meal takes its place.

FOOT-AND-MOUTH DISEASE IN GERMANY.—So extensive is the spread of Foot-and-mouth Disease amongst the cattle in Germany that the chief milk establishments in Berlin are now forced—in accordance with the provisions of the law—to take the precautionary measure of boiling their milk before selling it to the public.

SWINE PLAGUE IN AMERICA.—From Baltimore it is reported that the "Hog Cholera in Kent County is rapidly spreading. About 200 hogs have already been lost, and more will surely follow. Farmers are seriously to blame for much of this trouble, because they persist in throwing the dead carcases into the woods or streams. Two Bureau officers have left here for Centreville, Queen Ann County, to inform themselves about two serious outbreaks there. This county has been visited by this disease at frequent intervals, although free from bovine pleuro."

THE SMALL-POX MICROBE.—Dr. Sicard, of Béziers, in a memoir handed in to the French Académie de Médecine for competition for the Alvarenga prize, announces that he has at last discovered the long-sought-for microbe of Small-pox. He reports it to be a bacterion belonging to the class of cocci; round, with a transparent centre, umbilicated in the middle, while its edges are raised, and offering a diameter of five-and-a-half-thousandths of a millimetre. This bacterion can be readily cultivated on gelatine that has been sterilised by bichloride of mercury. It can be found at all stages of Small-pox, not only in the pustules of the skin, but in the mucus of the bronchial tubes and in the blood as well. It is likewise found suspended in the air of rooms containing Small-pox patients, and if water be allowed to stand in such rooms in open vessels it soon contains the Small-pox bacterion. However, when animals are inoculated with cultures of this bacterion, although they manifest uneasiness, the symptoms are entirely transitory, not at all serious, and, above all, show no relation to variola, either in its form or evolution.

CONTAGIOUS PLEURO-PNEUMONIA.—Professor M'Call, at the annual discussional dinner of the Renfrewshire Agricultural Association, held on Nov. 14th, at Paisley, read a long paper, in the course of which he observed that if inoculation were to free the country from the ravages of Pleuro-pneumonia, then it must be no half measure, but a system whereby every calf born or imported into the country must be subjected to inoculation with as much certainty as vaccination was applied to children, although he confessed the system must be brought about with enormous expense. He suggested that

the Minister of Agriculture should be memorialised to make the extinction of the disease and the granting of compensation the subject of Imperial legislation. Professor Williams strongly supported the arguments of the lecturer, and Professor Walley expressed the belief that if the slaughter order were properly carried out, the country would be rid of the disease in two years.

Good Oats.—How to tell good oats is a most useful matter, observes the *Mark Lane Express*, as it concerns every owner of horses in the country. We have just come across a descriptive article on the subject in a scientific paper, to which it is contributed by a good botanical authority. According to this, good oats are clean, hard, dry, sweet, heavy, plump, full of flour, rather like shot, and have a clean and almost metallic lustre. Each oat in a well-grown sample should be nearly of the same size, and there should be but few small or imperfect grains. Then, again, the hard pressure on an oat should leave little or no mark, and the kernel, when pressed between the teeth, should leave little or no mark. The skin should be thin, while it will be found that the size of the kernel will be less in proportion than the skin is thick. The colour of the oat is not very material, but white oats are generally thinner in the skin than black. Again, black oats will grow on inferior soils. Short, plump oats are preferable to large, long grains. In all bearded oats there is an excess of husk, but oats are not necessarily bad because they are thick-skinned and bearded. They must, however, contain a less amount of flour per bushel than thin-skinned oats without beards, and so are worth less money. It is a question of degree in value received, rather than of badness of quality.

Tuberculosis.—M. Daremberg has made a series of experiments on the lower animals, which inspire him with the hope of eventually obtaining a prophylactic vaccine for Tuberculosis. He observed, during his researches, that oil or fatty substances given to the animals under experiment enables them to resist the Tubercular infection when the virus is inoculated under the skin ; glycogen had the opposite effect. When the virus is passed directly into the blood death is inevitable. Cod-liver oil is only useful when the entire organism is not infected by the tubercular virus ; it is a protective agent, not a curative. In all forms of Phthisis strengthening food and tonics help the economy to withstand the influence of the poisons formed in the stomach and intestines by abnormal ferments ; they also facilitate the elimination by the kidneys, skin, etc., of the poisons resulting from defective nutrition found in the cells of different organs. The evolution of Tuberculosis can in some animals be rendered slower by gradually accustoming them to the influence of tubercular virus, and inoculating under the skin a small quantity of sterile Tuberculosis cultivation before inoculating the deadly one ; spinal medulla removed from an animal dead of Phthisis reduced to a pulp, and used for inoculation, has also this effect. M. Daremberg concludes from these researches that tubercular virus can be treated like mineral or organic poison ; it can be increased or decreased ; also that the animal economy can be protected more or less against the action of tubercular virus. With these data acquired he foresees the day when he will transform tubercular virus into tubercular vaccine. M. Nocard, a few months ago, read before the Biological Society a paper on "A New Form of Zooglœic Tuberculosis in a Cow." Some of its sputa was injected into a guinea-pig, and produced Zooglœic Tuberculosis. The cow was killed, but no special lesion was observed, only chronic Bronchitis. The bronchial tubes were dilated, and contained muco-pus. M. Nocard adopts MM. Grancher and Ledoux-Lebard's opinion, who consider the Pseudo-Tuberculosis observed in guinea-pigs and rabbits by MM. Charrin and Roger, also by M. Dor and M. Nocard, to be

identical with the Zooglœic Tuberculosis discovered by MM. Malassez and Vignal.

ARMY HORSES IN THE UNITED STATES.—There are nearly 10,000 horses in use by the United States army. Of this number about 10 per cent. are sold annually because of their unfitness for further cavalry or artillery duty, and about 5 per cent. are lost by death. So, in order to maintain the standard, it is necessary to purchase about 1,500 animals every year. When the stock of a garrison needs replenishing the Quartermaster-General's department is notified. An advertisement inviting bids is inserted in the prominent papers, and a contract entered into with the lowest bidder to deliver the horses at the desired point, if, after a suitable inspection by the Secretary of War, they meet the requirements of the standard fixed by the army regulations. The regulations require that the horse shall be a gelding of uniform and hardy colour, and from 15 to 17 hands high; from four to eight years old, and weighing between 900 and 1,200 pounds for a cavalry horse, and between 1,050 and 1,300 for artillery horses. There are other requirements necessary, such as the general build of the animals and their health. Whenever it becomes necessary to purchase the half-bred horses of California or Southern Texas the standard of the height is reduced to 14½ hands. Long-legged, loose-jointed, long-bodied, and narrow-chested horses, as well as those which are restive or vicious, are rejected. Most of the horses used in the army are purchased in St. Louis and Louisville, although the general rule of late has been to obtain the animals in the neighbourhood in which they are desired for use, the idea being to obtain thoroughly acclimated animals. The average cost of a horse is a trifle over 134 dols. As soon as the purchase is completed the horse is branded with the letters "U.S." on the left fore shoulder and a complete descriptive list is made of him, which always accompanies him wherever he is transferred. The horses are distributed by the regimental commander, and the riders or drivers are not allowed to exchange them or permit anyone else to use them. With every troop of cavalry a record of the animals is kept, containing the description of every one received and transferred, showing the kind, name, age, size, colour, marks, brands, or other peculiarities, how and when acquired and disposed of, the name of its rider and driver, and the use to which it is applied. The forage ration for a horse is fourteen pounds of hay and twelve pounds of oats, corn, or barley, and in special cases of hard service or exposure the grain ration is usually increased three pounds. In localities where good grazing is practicable for a considerable portion of the day, or during seasons when little labour is required of the animals, the ration is usually reduced. The animals usually last about six years, and at the end of that time are sold at auction, or before if they are disabled so as to be unfit for service. When sold the officer puts another brand on the horse, making it impossible for the horse to be sold to the Government at some other point. Condemned animals do not bring much. They are worthless for carriage purposes and are too much worn out to be fit for the arduous work of street-car hauling. They are usually sold to contractors, who employ them in hauling small loads. But the army horse does not last long after he drops out of the service. Usually he does not amount to much when the Government has no further use for his services, and his career thereafter is as short as it is uneventful.—*Washington Post.*

LAMBS REARED BY GOATS.—A novel and successful experiment in lamb-rearing has been carried through this season by Mr. David Picken, Milton Farm, Kirkcudbright. Early in the lambing season several ewes died, leaving families, and Mr. Picken having three nanny goats on the farm, set two lambs to one of these and one lamb each to the other two. The foster-mothers

did not for a time take very kindly to the lambs, but in a day or two they became inseparable, and the lambs throve beyond expectation, being the sturdiest for their age on the farm. In one instance the lamb has a decided talent for climbing and leaping, and no wall or dyke on the farm presents any barrier to its progress.

Correspondence.

BLIND HORSES.

SIR,—Having the supervision of a large number of street-railroad horses, numbering about 9,000, about two per cent. of which are blind in both eyes, and notwithstanding their good condition I have observed almost in every instance that blind horses shed their coats only in the fall of the year, retaining a very short summer coat throughout the winter, and in the spring growing a very heavy winter coat, and retaining it throughout the summer. I have consulted several authors and some of my professional brethren on the subject, but failed to obtain any information as to the cause. Can any member of the profession throw any light on the matter?

Boston, U.S.A. ALEXANDER MARSHALL, M.R.C.V.S.

TO CORRESPONDENTS.

ERRATUM.—In the Editorial for last month, page 333, line 18, for "directly" read "directed."

THE report of Proceedings of Western Counties Veterinary Association will appear in next month's Journal.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from S. M. Taylor, Madras; R. Ward, Baltimore, U.S.A.; A W. Hill, London; R. W. Burke, A.V.D., Athlone; J. McKenny, Dublin; F. C. Mahon, Southrepps; J. Malcolm, Birmingham; W. Penhale, Barnstaple; F. E. Place, London; D. Hutcheon, Cape of Good Hope; W. F. Greenhalgh, Leeds; A. W. Hill, London; A. Marshall, Boston, U.S.A.

BOOKS AND PAMPHLETS: *H. Weir*, Our Cats and all about them; Séance Publique Annuelle de la Société Nationale d'Agriculture de France; *J. H. Steel and T. J. Symonds*, Materia Medica Judica; Encyklopädie der Gesammten Thierheilkunde und Thierzucht; Procès Verbal de la Academie Royale de Médecine de Belgique; *F. Smith*, Chemistry of the Urine of the Horse; Hydrophobia of 1889, its Cause and Cure; *H. V. Stockfleth and C. Steffen*, Handbuch der Thierärztlichen Chirurgie.

JOURNALS, ETC.: *Wochenschrift für Thierheilkunde und Viehzucht; Thierarzt; Journal of the Agricultural Society of Victoria; Journal of Comparative Medicine and Surgery; American Veterinary Review; Horses Illustrated; Colburn's United Service Magazine; Annales de Méd. Vétérinaire; Repertorium der Thierheilkunde; Live Stock Journal; Lancet; Revue Veterinaire; British Medical Journal; American Live Stock Journal; Quarterly Journal of Veterinary Science in India; Edinburgh Medical Journal; Recueil de Med. Vétérinaire; Journal de Med. Veterinaire et de Zootechnie; London Medical Record; Deutsche Zeitschrift fur Thiermedicin und Vergleichende Pathologie; Echo Vétérinaire; Clinica Veterinaria.*

NEWSPAPERS: *Melbourne Daily Telegraph; North Star; Edinburgh Evening News; New York Herald.*